

A circular architectural plan, possibly a floor plan for a large building or a conceptual diagram. It features a central dark, irregularly shaped area. Surrounding this center is a ring of rectangular units, each containing a smaller, rounded rectangular shape. The units are arranged in a circular pattern, with some units at the top and bottom being slightly larger than those on the sides. The entire plan is set against a dark background with faint, light-colored lines radiating from the center to the outer edge, creating a grid-like structure.

Equilibrium

The Work of
Nicholas Grimshaw & Partners

Hugh Pearman

PHAIDON

Nicholas Grimshaw is among the pre-eminent figures of the British architecture scene. The practice of Nicholas Grimshaw & Partners has come to international prominence and renown, having built upon its reputation for structural experimentation and technical finesse in the 1980s and 90s. The practice has now embarked on some of its most exciting and diverse work: the Eden Project in Cornwall, the Ludwig Erhard Haus, Berlin, the National Space Science Centre in Leicester, the Caixa Galicia Foundation Building in La Coruña, Spain, and the redevelopment and restoration of Brunel's Paddington Station, London.

In this book Hugh Pearman examines Grimshaw's recent work, and expertly describes the structure of the buildings, giving insights into how they are used and experienced and how they respond to their environment. Pearman's introductory essay traces the development of the practice from the early 1990s to its present finely balanced and refined state. Nicholas Grimshaw himself introduces all eighteen projects. The book also includes a lecture by Grimshaw on architecture and the environment, and an interview in which he describes the evolution of his ideas and the influences which have informed his thinking.

Equilibrium The Work of Nicholas Grimshaw & Partners



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Hugh Pearman



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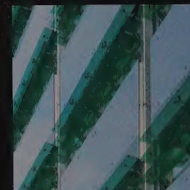
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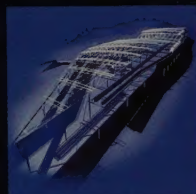
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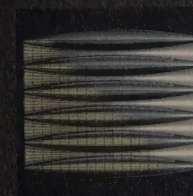
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**In memory of
William Cracknell,
Boatbuilder**

Getting the details right was,
to him, simply part of
'doing a proper job'.



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Nicholas Grimshaw & Partners,
Directors. From left to right:
David Harriss, Neven Sidor,
Nick Grimshaw, Christopher
Nash, Andrew Whalley

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Foreword

From the beginning, when we would sit and argue about the size of a hexagonal-headed bolt in relation to its washer, Nicholas Grimshaw & Partners has been about the way architecture is made. We believe all buildings must have beautiful structures (or bones) which will live on through many changes of use and even changes of cladding, or skin. We believe that however wonderful the spaces we create, it is still possible and even likely that they will be altered. Yet, however many metamorphoses our buildings may go through in their lifetime, we feel that every ounce of our effort should be dedicated to making them as good as possible today. This means using new materials and developing new details which enable them to be used effectively.

To do this means an enormous team effort. We have a Design Review process whereby we constantly discuss and criticize each other's work. We study the finished buildings of other practices and learn by their achievements. We also learn from their mistakes. We listen to our clients and our fellow consultants throughout the process of making a building. We subscribe wholeheartedly to the idea that successful architecture today is created by willing partners working together.

The dynamic we create is fuelled by diversity of age (the average age in the office is thirty one), by diversity of nationality, and by the sheer joy of actually putting up buildings. We are not a theoretically-driven practice - we like to build. It is our skills, or perhaps our approach, that are called upon from a widening circle of clients, for many of whom we have done more than one building.

The practice has grown and the scope of our work has widened, yet we retain the qualities for which we first became known. This is because we continue to develop design rigour within our office and we continue to learn from ourselves and others. Seven of the projects in this book are in mainland Europe and we have created strong working relationships with other firms in order to achieve this. This has been a good experience for us and I think I can say that all of us remain passionate Europeans.

In terms of design, in terms of materials and also in terms of differing views of the future, this learning from cultures across the world is a defining characteristic of the practice now. We have our solid core of experience. What we look forward to is enriching our designs by every physical and electronic means possible. By doing this we believe we can produce architecture for our clients which not only meets their basic needs, but is better than anything they could have dreamed of.

Nick Grimshaw

Introduction

What is a Grimshaw building? What are its underlying characteristics or its aesthetic? What does it try to do in the urban context, what marks it out? These questions are particularly valid now, since the nature of Nicholas Grimshaw & Partners is changing as steadily as the type and scope of commissions it receives. This book describes a firm of architects with an evolving attitude towards architecture and sustainability, an increasing diversity in workload and a sharing of responsibility between the key individuals.

The practice is now fully fledged: it can draw fruitfully on its years of research and experimentation which have established finely-honed responses to a wide range of conditions. It has achieved a sense of equilibrium: a state of poise resulting from a balance of energies. Maintaining this is an active and dynamic process. This is a practice fully aware of its own future, with a younger generation of four directors – David Harriss, Chris Nash, Neven Sidor and Andrew Whalley – taking forward the Grimshaw approach. The projects in this book – the commissions won since the completion of the celebrated Waterloo International Terminal in 1992 – show how that approach and aesthetic are developing in this collaborative environment.

A number of breakthroughs are recorded here. These include the practice's first art gallery, for the Caixa Galicia Foundation in Spain; its first bridge, at IJburg in The Netherlands; its first Berlin and City of London office buildings; its first faculty building, at Surrey University; its first private house, in Germany; its first commercial foray into pure product design and its first sports grandstand, at Lord's Cricket

NGP Conference Room,
1 Conway Street, 1998.



Ground. There is steadily more ambitious airport work, from Heathrow and Manchester to Zürich. And there is a roster of landmark UK Millennium projects of greatly differing scales and uses: a wave of essentially publicly funded schemes of an ambition not seen for decades.

In addition, there is a handful of unbuilt projects of significance to the evolving work of the practice. This growth of work, both typologically and geographically, creates its own momentum. At the time of writing, the Grimshaw office employs 120 people, which is a lot for a fully-computerized European architecture firm. It is unusual in having a semi-autonomous product design division, run by Duncan Jackson and Eoin Billings who have a big input into the design of the componentry of NGP buildings.

Size alone is meaningless, however: more important is the atmosphere of the place. The practice headquarters in Conway Street, London, does not feel like the nerve centre of a large international practice. It is the same building that the firm has occupied for years. Space is now at a premium; a nearby annexe has been brought into use, the ground floor and basement have been re-planned, but this is the same building that one associates with Grimshaw's when it was a much smaller concern.

Nicholas Grimshaw himself still occupies the glass-walled office on the first floor. His fellow directors wander in and out to discuss the course projects are taking. Out of, say, thirty live projects, perhaps half a dozen at any one time will be at the active design stage. As he heads many of the design meetings, this

NGP Offices, 1 Conway Street.



is a comfortable number for Grimshaw to be directly involved in alongside his colleagues, together with the undercurrent of competition work.

As a result, things are still surprisingly intimate. In the very volatile world of architectural employment, the *modus operandi* of the practice is an expression of two-way loyalty – directors to staff, staff to directors. Nobody can wholly escape the boom-bust cycle of the design and building industry: before the commission for the Waterloo International Terminal in the late 1980s, for instance, the practice was down to twenty or so people. Having subsequently reached a peak of eighty, there was another disconcerting dip around 1994, towards the end of the UK's last recession, before the present wave of commissions came on stream to carry the office to new heights. The practice also prefers to hang on to people it knows and respects, even establishing working collaborations with those who, in the normal course of events, leave to form their own practices. Work tends to be referred their way. Grimshaw himself is keenly aware of his responsibilities as employer, but he is also a man of routine who builds up working relationships over time. That way, the work of the practice can develop.

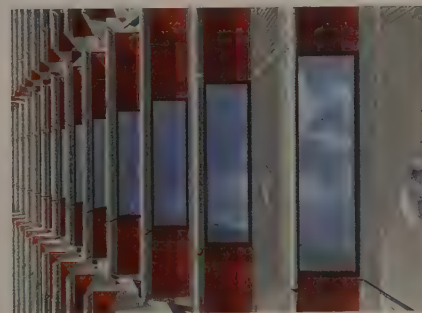
Periods of expansion, by contrast, bring in fresh blood to rejuvenate the body of the firm. In early 1999, for instance, the average age of the NGP office – including Grimshaw and his directors – was thirty-one, so making it a younger concern than many brand-new practices. 'I'm proud of that,' he says. 'We've always fed from the bottom. It leads to liveliness, a good level of debate in the office. We have this idea of chucking

ideas on the table and letting the best one win.'

It is, indeed, apparent that this is not an office where the man with the name on the letterhead makes all the decisions. On the contrary, the other directors are a strong and independent-minded bunch. Sometimes Grimshaw would do a detail differently or choose some other material, but he respects the reasoning of a colleague for doing it another way. Then again, he has greater experience on his side. Which may be why he remarks, as an afterthought to the above: 'A lot of people say I find ways of pushing things my way. That may be because I've learned how to argue for things over the years.'

There is a touch of Wright in that afterthought, and this is no coincidence. He always acknowledges that architecture is hard work, that he is still learning his trade. By extension, that applies to the whole practice. Grimshaw refers time and again to this business of continual learning. For him, as a British architect now working on commissions in the United States – such as the \$40 million Donald Danforth Plant Science Center in St. Louis, Missouri – the American architectural culture is fascinating. Given their background in highly-detailed design, it comes as no surprise to find that Grimshaw and his directors do not incline towards the commercial side of the business, where architects do broad-brushstroke designs that are detailed up by others. Instead, they lean towards the parallel American craft tradition; the tradition exemplified by both Wright and Mies, the tradition of the exact detail.

For Grimshaw, it is Wright's steady growth as a craftsman-architect that is important: the evolution



Donald Danforth Plant
Science Center, St. Louis,
Missouri, 1998–.



from Wright's early experiments, continually tinkering with his modest family house in Oak Park, Chicago, to a work of mature genius, such as the Johnson Wax building in Racine, Illinois. Equally, he admires the steadily evolving oeuvre of Renzo Piano, whom he regards as a master of materials. Hans Scharoun and Alvar Aalto, by contrast, he finds intriguing for other reasons; these were architects who were much taken with materials and texture and the sequence of flowing spaces, but were far less interested in structure (and in Scharoun's case, detail) than Grimshaw. The fact that he mentions these names is interesting: one thinks of the Aaltoesque sinusoidal roof inside the Vitra building way back in 1983, or the way the practice increasingly tends to use flowing and curving forms rather than right-angles. Like professors of anatomy, the senior NGP architects believe that you have to have a thorough understanding of the bone and sinew beneath the skin in order to arrive at the eventual form.

Determined that this accumulated learning and reputation should not be dissipated, Grimshaw, as chairman, has overseen a restructuring of the practice so that eventually half of the shares in the business will be owned by the directors and half by an employee benefit trust. This is based on the model of the engineering partnership of Ove Arup, with which Grimshaw has worked on many projects over the years: the idea of a common cause, commonly owned. Thus, it is impossible for anyone else to buy the firm, and equally impossible for it to be broken up. Nor can it be floated on the stock market, something that would create an immediate conflict

of interest between clients and shareholders. Grimshaw is happy with the fairness and durability of the new structure. 'I thought long and hard about this. It's the idea of quality, of having bright people coming up from the bottom, and subscribing to a common philosophy of excellence,' he says. 'Where you can actually turn down work that is not right.'

A steady evolution, then, explains the consistency of approach that Nicholas Grimshaw & Partners has shown over the years. For this reason, there is a feeling in the world of architecture, and outside, that the practice is somehow apart, operates according to its own system. Labels – beyond the catch-all one of 'progressive' – tend not to stick easily. It has never deviated from its course, never nodded to fashion – and was consequently seen by some as being out of step in the early post-modern era. This did not ruffle Grimshaw or his colleagues, who anyway tended to keep a low profile, preferring to run a practice known for clarity of thought rather than short-term glamour. Then again, another factor comes into play: as a result of NGP's continuing and increasing portfolio of overseas work, Grimshaw personally lectures a great deal in countries other than the UK. He admits he enjoys the cultural exchange involved, seeing buildings by others, meeting their architects; he likes widening his perspective in this way. Perhaps as a consequence, the practice is as much appreciated in Germany, for instance, where it has enjoyed a steady series of commissions over the years, as it is in the UK. This may be less to do with the level of architectural debate and aesthetic restrictions in Britain (NGP has always done well by



Opposite and above:
Hal 9000, fit-out for Cemex,
Monterrey, Mexico, 1998.
The single-storey concrete
bunker houses the mainframe
computer system for a firm of
cement producers.



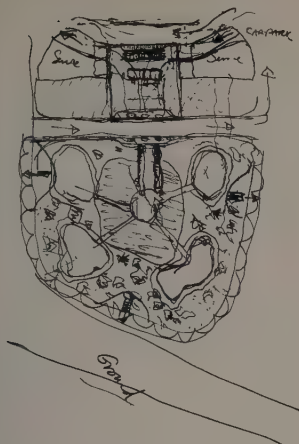
Herman Miller Factory, Bath,
1976

the British planning system, and enjoys considerable goodwill) and more to do with the progressive nature of German corporate clients.

In Germany, large family-run businesses prosper in a way alien to the UK, with its shareholder culture and often short-term view of investment. An early NGP project in Germany, for instance, was for Rolf Fehlbaum of Vitra, the family-run contemporary furniture company outside Basel. The rapidly-built, 1983 factory building and a later addition were the first of what came to be a large collection of fine buildings at Vitra by architects from around the world. For the company Mabeg, near Dortmund, an industrial-design commission for the Profile One signage/furniture system was paralleled by a masterplanning commission for the Mabeg factory site and, subsequently, the first new building on the site. In the early 1990s, NGP was sought out by Günter Blase, proprietor of the Igus plastics company near Cologne. What began as a factory commission – several times extended as the company prospered – eventually also resulted in something far more personal; a house for Blase's son and daughter-in-law, Frank and Daniela, who are also immersed in the business. The 'Spine House' in the rural landscape outside the city was Grimshaw's first one-off home, and enabled him and his collaborators and former employees Mark Bryden and Martin Wood to reinvent the domestic environment by combining two disparate forms within an essentially classical plan.

It would be unusual – though thankfully not impossible – to find industrial clients so engaged with the possibilities of architecture in the UK. Grimshaw

describes the nature of such relationships as 'a philosophical alliance with a firm that believes in us, and in which we believe ourselves'. Igus later planned to expand into the UK and the United States: at the time of writing, other German companies with global interests have visited Igus and commissioned NGP – a word-of-mouth process of recommendation that, again, is not always how things are done back home. Note how many of Grimshaw's early commissions in the UK were for overseas-based companies: Herman Miller, Citroën and BMW among them. Or how a series of mid-period commissions came from Sainsbury's, a rare example of a large, family-run British company. The difference in attitude to architecture between companies of differing structures is intriguing, since it is not always merely a function of cost. It is more to do with the fact that the people involved in the process have a personal stake in the business, are aware that it has a presence beyond the year-end balance sheet, and are consequently in it for the longer term. The building, therefore, comes to represent the company on a more than merely actuarial basis, and in turn directly affects the way the company operates from that moment on. When the relationship works, repeat commissions flow. One can draw parallels between the way NGP is run, with its emphasis on continuity and loyalty, and those businesses the practice feels most comfortable dealing with, which share similar concerns. Now that NGP is increasingly global in its work, it finds itself having to establish similar positions of mutual trust with other architects in other countries. The obvious challenge is to ensure



Nick Grimshaw sketch plan of St Botolph Street office building.

that such collaborative ventures are imbued with the Grimshaw ethos.

Despite its origins in the radical world of the Architectural Association in the early 1960s, NGP is not an overtly political practice – although the lectures given by the principals always promote a socially aware and sustainable design approach, with quiet insistence. Too few other noted architects have invested as much time in the fundamentals of energy-conscious design, from the embodied energy and recyclability of the building materials to the reduction in the use of generated energy day by day. 'Paper architecture', however, has never been high on the agenda, with very rare exceptions such as the speculative airport terminal design for the 1991 Architecture Biennale in Venice. Instead, NGP builds, with a particular attitude towards social improvement and the building as urban catalyst.

The architecture produced has never been solely functionalist, although there was a time when the need for low-cost problem-solving might have made it appear so. The very first Grimshaw project – the prefabricated bathroom spiral pods for a London student hostel, in 1967 – revealed a functional expressiveness and an interest in the potential of organic forms that was to re-emerge, fully formed, some twenty years later. Early sketches of projects very often explore a shape, a metaphor or an image, at the same time as they rough out the disposition of accommodation. Increasingly, this has become part of the brief – clients very often want a landmark building. This is one type of functional requirement which persists; but the more traditionally functionalist

strand also continues through to the present. Look at the 1968 Park Road apartment tower in London, and compare its appearance and rationale with the 1999 Mabeg office in Germany: you see a particular way of thinking about free space around a fixed core, of turning a corner, of cladding details refined over more than thirty years. Similarly, the Orange Call Centre in north-east England demonstrates that the 1960s idea of the adaptable slick shed has now reached a state of considerable refinement.

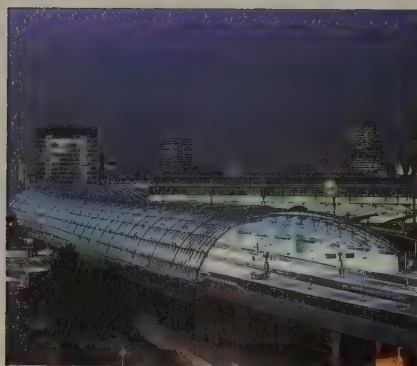
The directors have a range of individual responses to the question 'What is NGP?'. For David Harriss, it is not so much a question of technology – which is simply a tool, he remarks – as a more abstract quality. 'A building should have honesty, so people can see how it works,' he says, adding that 'some of our best buildings come out of responding to the constraints of the projects'. A Harriss project exemplifying both these strands would be the Lord's Grand Stand.

Chris Nash talks of the practice developing a community of architectural themes co-operatively. 'Our work is concerned with producing buildings and products which are noticeably more joyful, interesting and understandable than the norm through an intelligent process.' For Nash, it is vital to ask the question 'Is it beautiful?'. His family of NGP buildings includes the RAC Regional Headquarters and the EIHMS faculty at the University of Surrey.

Neven Sidor highlights the sense of exploration. 'A team of designers follows a completely rational chain of decisions, through an almost magical territory unfettered by preconceived ideas, until they arrive at a destination that they themselves find surprising.'



Igus Headquarters and Factory, Cologne, 1992.



Above, opposite and overleaf:
Waterloo International Rail
Terminal, London, 1993.

Such as, perhaps, Ludwig Erhard Haus in Berlin, or the IJburg Bridges outside Amsterdam.

For Andrew Whalley, whose projects include the Paddington Station masterplan and the Donald Danforth Plant Science Center, there is absolutely no house style, only a shared approach, what he calls 'a culture and philosophy that enables individuals to create an appropriate design solution.' He believes everything must be questioned from first principles, even a competition-winning NGP design, in order to achieve full understanding of what is required.

While the present shape of NGP results from the growing contribution of this confederation of individuals over many years, the pace of change noticeably quickened towards the close of the century. In the early 1990s, the firm completed two buildings that changed perceptions radically: the British Pavilion at Expo 92 in Seville, with its beautiful and environmentally effective water wall, and the Waterloo International Terminal in London, which reinvigorated the tradition of the grand railway station. Waterloo can be seen as a pivotal achievement. Its effect in the UK was galvanizing: here was a gateway to Europe worthy of the name, a spectacle in its own right, and an enduring one. People still gather at Waterloo just to stare at the noses of the Eurostar trains drawn up under the great curving canopy, transfixed by the romance of trains departing directly for Paris, Brussels and beyond. Unusually for the UK at the time, the Terminal was of a scale and ambition which far exceeded its Continental counterparts. Meanwhile, the Expo building, with its shimmering facade, extensive solar

shading and naturally cool, cavernous interior in a blisteringly hot climate, had provided valuable new international exposure. Although, as we have seen, overseas work had been a part of the equation since the early days, the type and scale of new work overseas was about to change radically.

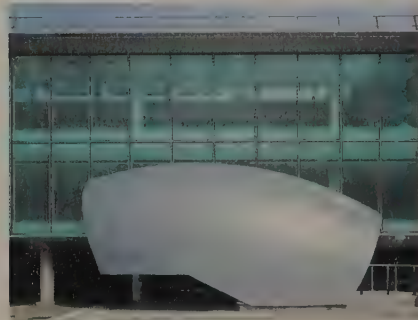
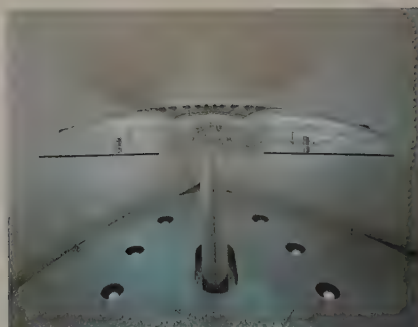
An early indication of the way things were going was the competition-winning Ludwig Erhard Haus in Berlin (the headquarters of the Berlin Chamber of Commerce and the Trades Associations named after the post-war economics minister and chancellor). This building, as much as any other, served to crystallize the thinking of the practice in the post-Waterloo period. Its genesis was protracted, the design was greatly simplified over time and there were battles with the conservative Berlin planning system. The competition was in 1991, at the optimistic start of the period of German reunification. It did not start on site until 1994, and was finally completed at the end of 1998. During this period, complete districts of Berlin were being rebuilt. But out in the old western centre, the design of LEH gradually evolved with, what at times seemed, half of the practice working on it together with the Berlin-based NGP associate Michael Pross. Its 23,225m² were then built rapidly, its arches hoisted into position as dramatically as the timber frames of a medieval barn. The site had the advantage of being well away from the architectural zoo of the old Wall zone: the only contemporary architectural rival is a nearby stubby 1994 office tower by Josef Paul Kleihues, with a somewhat startling revolving shark-fin solar collector on its roof.

Like Waterloo, the Berlin building responds to a









NGP exhibit for 1991
Venice Biennale and
Manchester Airport, 1998.

constricted, irregularly-shaped urban site. The key element of both projects is the use of a sequence of arches of identical type, but varying size in order to take up the footprint of the site most efficiently. In both cases, 'organic' architectural forms emerged to achieve this end. The original sketch inspiration for Waterloo was the asymmetrically arched form of a skeletal human hand: in Berlin, there was the idea of a fish – although the building as completed came to be known as 'the Armadillo'. This strand of metaphorical architecture continues in such projects as the IJburg Bridges outside Amsterdam in The Netherlands, which will link overspill communities on a series of new islands created in Holland's inland sea. There, the swooping forms of the bridge arches are faceted as if to give the impression of the bone structure of some great marine organism.

There are other parallels – as well as some significant differences – between Waterloo and Berlin. The famous asymmetrical, tubular-steel, pin-jointed arches at the International Terminal create, what is in effect, a rooftop enclosure, since there are two further levels of the building – concrete framed, in compression – beneath the railway tracks. The arches at LEH are, in contrast, symmetrical, box-section structures from which the entire building, apart from ground and basement levels, is suspended in tension. But, as with Waterloo, there are points at which the flexible part of the Berlin building has to move in relation to the solid elements. These points are taken up in the lobby by precisely engineered and clearly visible sliding connectors, and expressed elsewhere in hinged bridge links to floor-standing lift

towers, unconnected to the suspended structure of the main building. Had the very conservative Berlin city planners not insisted on such constraints as a vertical facade rising to a given visible cornice height, and an undeviating street line, these structural gymnastics would be more apparent to the public, as they are in the fully-exposed Waterloo. But there are also advantages to the relatively sober main elevation of LEH, since it makes the discovery of the generous internal spaces all the more unexpected. It is unlikely that the multi-headed client for this commercial office building envisaged it becoming one of Berlin's unmissable party venues, but such it has turned out to be. Compare this with the RAC, with its three grand stairs meeting on a triangular landing at the very centre of the plan: or Waterloo, again, with its provision for public gawping. In all these cases, the design is as much about personal interaction and architectural drama as it is about net-to-gross square footage or basic functionality.

The architecture of these buildings is thus a distinctly social architecture. It is impossible to imagine Waterloo, LEH, RAC, Orange or the railway and airport projects without their constant human bustle and excitement. Unlike buildings which appear at their best in a cold, depopulated state, NGP's seem positively to welcome the blur, even the untidiness of humanity. An NGP building is always tough enough to be thrown about a bit; but what comes over constantly, talking to members of the practice, is the fact that the buildings are not generated so much from usage diagrams, envelope studies and the like, as from a prime consideration of how people will

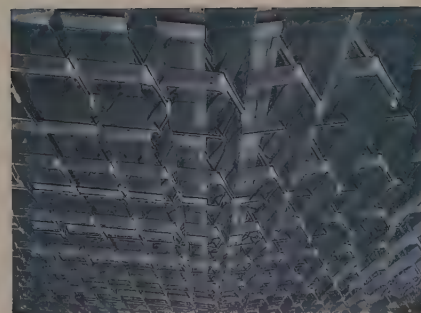
move, relate and go about their business. The aluminium open staircase rising the height of the Conway Street studio is an important reference point.

Other projects demonstrate this social approach in different ways. Like RAC, the British Airways Combined Operations Centre at Heathrow brings together staff who were previously scattered across several nondescript buildings. There is, however, no grand meeting place at its heart as there is at the RAC building: this is not least because it is used primarily as a short-term base by crews who receive instructions before moving off around the world, combined with the need for total flexibility of use in its floorplates. Like the RAC, it is also the physical expression of a call centre and monitoring function: from here, the exact position and course of every British Airways aircraft is logged and communication is maintained. But above all, it has a presence that reinforces the sense of corporate belonging: a focal point in the very diffuse airport environment. Whereas the form of the RAC building is, in a sense, moulded by the movement of traffic around it, at Heathrow form is almost entirely dictated by more directly functional considerations. First among these is the need for it not to distort the radar picture of the airport: it has to be a 'stealth' building. The result – given that this would otherwise be a very conventional, rectangular-floorplate, three-storey office block, of a type most often found in business parks – is something of a *tour de force*. Its skin has a large proportion of glass (which gives a usefully low radar reflection), but glass in numerous different forms. Its walls curve sharply outwards, to reduce

both the radar 'signature' and solar gain. This, together with the need to acoustically insulate the building from plane and nearby traffic noise, is exploited to create a layered facade of blue glass, the cladding being blue, curving, horizontal, aluminium panels interspersed with circulation towers of glass-blocks. The illuminated building acts as a sculpture at night.

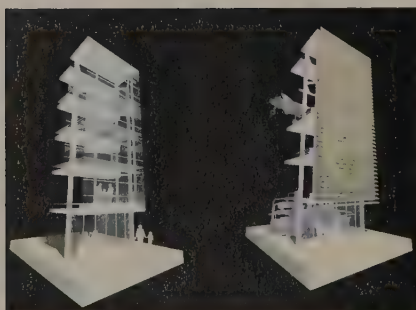
In direct contrast to this, the competition design for the British Embassy in Berlin internalized its most dramatic architectural gestures. In keeping with the conservative desires of Berlin city planners, and the security demands of the diplomatic service, the building was mostly to be behind high walls, with only one east-facing facade to the street. This one, glass facade was screened by tall stone fins supporting the roof, giving a solid appearance in oblique views from Unter den Linden. Within, however, the mood changed. The building plan was a T-shape, so allowing two landscaped atrium courtyards – a public one at the front, a more private one for embassy staff at the rear. Thus a world within a world was designed on a very constricted site.

Something of the same thinking, but on a more expansive scale, applies to the Donald Danforth Plant Science Center in St. Louis, Missouri. The aims of this not-for-profit organization are related to those of another NGP client, The Eden Project in Cornwall: to make research into plant species – vital for the existence and wellbeing of mankind – coexist with an educational visitor attraction. Here, it is an orthogonal building which, in plan only, bears a passing resemblance to Ludwig Erhard Haus: a main internal



British Airways Combined Operations Centre, Heathrow, 1993.

Millennium Point, Digbeth,
Birmingham, 1997.



'street' runs the length of the main facade, from which two full-height atria extend through its depth. These atria with their landscaped gardens form the social centres of the building, since it is here that visitors and staff meet. Conference rooms, auditorium, library and restaurant are set in the gardens, accessible on two levels so that private and public events can take place there. In a development of one of Grimshaw's particular preoccupations – the responsive, adaptable building skin – the Plant Science Center deploys an array of blinds and opening louvres controlled by climate sensors. These are powered by a rooftop array of photovoltaic cells, reminiscent of the British Pavilion at Expo 92. The low-energy, sustainable agenda of the building is reinforced by NGP's most extensive use yet of timber, both for cladding and for aspects of structural framing.

Some of the latest work of the practice is to do with complex adaptation projects, sometimes in a historic context. Large airport commissions at Heathrow (the Terminal Three extension), at Manchester (Terminal One) and at Zürich are all to do with adapting and humanizing the bleak spaces often made by having to move huge numbers of people. This was a type of job that was to become increasingly familiar: as at Paddington Station in London, another large railway/international terminal commission in the wake of Waterloo, it involved fundamentally rethinking an existing transport building. Large-scale building work has to take place at full tilt while the buildings remain in tumultuous operation. Such work is as different as it is possible to imagine from the early image of the practice as

designers of simple, low-cost industrial enclosures.

At Paddington, an important part of the work involved clearing away the accretions of the years in order to reveal more fully the original design of Brunel, Wyatt and Jones. Then, the task was to update the famous station as a check-in and departure point for Heathrow Airport by creating a new concourse area. This act of squaring the circle – preservation on the one hand, all-new architecture on the other – is repeated in the new Bath Spa, one of a clutch of Millennium projects. Here again, the response is to make the new building out of the found object. The nature of the found object varies considerably – a worked-out clay pit in the case of the Eden Project, under-used later additions in the case of Paddington, and a complex of disused Georgian and 1930s pool buildings in Bath.

The Millennium projects – the most visible expression of the public money yielded by Britain's National Lottery, launched in the mid-1990s – have provided an extraordinary range of work for the practice, but not without some considerable problems along the way. Mostly these were to do with the question of having to work, unpaid or underpaid, on projects that were vulnerable both to political decision-making and which required 50 per cent of their funding to be made up from other sources, whether private or public. No seed capital was made available to develop designs. There could also be difficulties retaining design control over a project, once it had been funded and approved. All architects who won Millennium project commissions suffered in this way: NGP, however, not only received

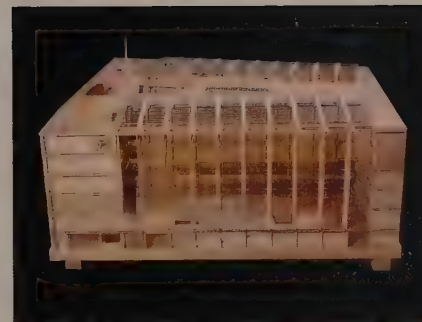
a greater number of larger projects than almost anyone else, but managed to see them through the fraught times and the inevitable redesigns, and emerge towards the end of the process with design integrity in place. The Eden Project is a reinterpretation of the idea of the botanical glasshouse, expressed as a series of geodesic domes, forming climate 'biomes', arranged around the contours of its former quarry. There is the National Space Science Centre in Leicester, with its podium of exhibition and education space and transparent 'rocket tower', to be built on another ex-industrial 'brownfield' site. There is Millennium Point in Digbeth, Birmingham, a city-centre technopolis; and there is the new Bath Spa in the famous west of England city with its hot mineral springs.

Of these, the Bath Spa represents the most significant step forward for the practice, since it addresses the crucial issue of contributing a new building of clear modernity and considerable complexity in one of England's most sensitive historic settings. Much restoration of the previously disused and neglected Georgian baths on the site is also involved; the marriage of new and old extends to the landscaping of the surrounding streetscape, and the architects are collaborating with a light artist, Vong Phaophanit, on the project. It distils the whole experience of the practice into a new context. It is no surprise to learn that this, together with the equally challenging Caixa Galicia art gallery building in La Coruña, Spain, has been a largely personal project for Grimshaw himself.

Is it possible to pin down the style of a Grimshaw

building? Yes, in the sense that there is a certain way the practice puts buildings together, a way it has of expressing designed components from structural columns to connectors and fasteners, a concern with generous circulation and social spaces. There is nearly always a very high degree of prefabrication, of dry construction: it is almost startling to come across a new building that breaks this rule, such as the European Institute of Health and Medical Sciences at Surrey University (EIHMS). For almost the first time, NGP has been experimenting with poured-concrete construction for stairs and exposed ceilings, combined with a new interest in its laminated timber roof structure. There is an obvious delight in finding new ways to exploit these materials.

The practice always seeks alternative and better means to address an architectural problem, such as a suspended glass wall or the creation of adaptable free-span space. In the early days, perhaps, all this might have been done with a degree of austerity. The buildings were tighter, more introverted. In recent years, the style has loosened. Structure and, to a lesser extent, services are increasingly celebrated in a way that goes far beyond function – although there is always a functional programme at the bottom of it. This change can be attributed to a number of causes: the influence of a new generation of architects in the practice; new building types to consider; a different, more ambitious breed of client; bigger budgets; an all-round greater confidence and more relaxed approach to building; and the new design possibilities offered by computers, particularly when designing on the curve. Waterloo could not have been built



British Embassy, Berlin, 1995.



Western Morning News,
Plymouth, 1992.

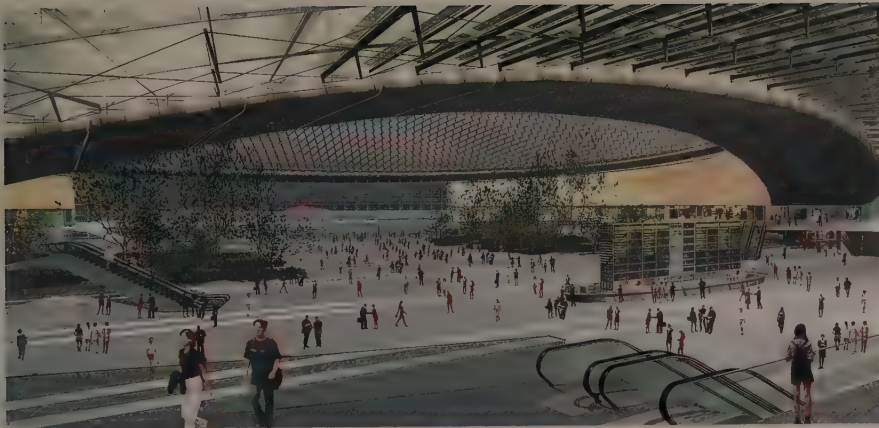
without computers: the Sainsbury's store in London's Camden Town, completed in 1988, was the last project from the office to be essentially hand-drawn.

Grimshaw is personally happier than some other architects of his generation to talk about issues of style. It is interesting to note that he claims he had never heard the phrase 'landmark building' until it was uttered by his client at the Western Morning News, Plymouth, a building completed in 1992. There, the clients actively encouraged their architects to stick their necks out. Grimshaw, Chris Nash and the team started from the idea of an outwardly-curving wall to avoid sky reflections, and ended up with a symmetrical, ship-like form, complete with offset bridge like an aircraft carrier, with its unique curving outrigger masts known as 'tusks'. Grimshaw talks of the joy and ebullience of the WMN. But there is, he says, nothing superfluous about the tusks: every part, including the section projecting above the eaves line, is doing something structurally. Similarly, at the EIHMS, the need to provide a gateway building for the hillside university campus led to the development of a highly distinctive, zinc-clad, canted nose cone. This maximizes the drama of the sloping site, but also conveniently provides lecture rooms of steadily increasing size on each floor. Whatever the factors influencing the designs, it has become clear that NGP has moved into an area where the symbolic nature of architecture becomes steadily more important.

This has clearly been liberating. The competition-winning design for the Pusan Bay high-speed rail terminal in Korea, for instance, is a highly complex exercise in urban and landscape design and people

movement on existing railway land, mediating between the backdrop of mountains and tall buildings and the flatness of the bay. It contains within it the seductive idea of a secret garden city. But it focuses on one big idea: a tilting, glazed, honeycomb-structure roof over the main concourse, looking out across the bay like the compound eye of some enormous insect. The 'eye' emerged from the swirl of circulation patterns on the site, as did the gull-wing shape of the Zürich air terminal – another important win against stiff international competition – or, in a different way, the RAC Headquarters moulded by traffic circulation. In all these cases, Grimshaw both projects and freezes movement patterns to create his landmark architecture. It is important to him, and to us, to know that there is an underlying logic to the form, that it is not simply architectural virtuosity for its own sake.

The difference between his approach and that of some others is shown by his design for the Victoria & Albert Museum extension in London, which came second to a Libeskind design. Here, too, was a client who wanted a landmark, and said so. The Museum had looked enviously at the popularity of the Louvre in Paris and seen how architecture could both rationalize a rambling cultural complex and be seen as a destination in its own right over and above the lure of its collections – the Guggenheim syndrome. Libeskind went the route of overt structural virtuosity, linking the various levels of the Museum in the process, and creating an intriguing, enigmatic object on the street. This is an entirely valid response, but it is not one you could ever imagine coming from the



Pusan Bay high-speed rail terminal, Korea, 1997.

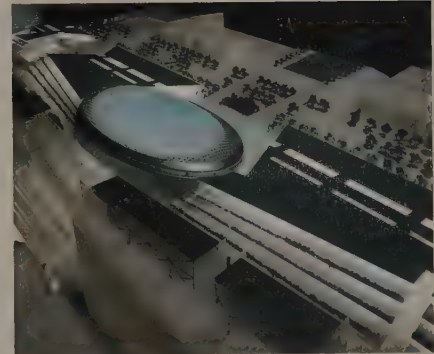
Grimshaw stable. Grimshaw and his colleagues would never want to generate such a shape from the given functions and movements on that site. Their design also linked the Museum wings both horizontally and vertically, but did so in an entirely different way: via a building expressed as a solid cube within a larger glazed cube, set within the recess of the site. Its architectural effects were achieved by means of space and light rather than expressed structure. The envisaged adaptive skin would both respond electronically to external and internal conditions, and also act as a changing public display case for the Museum's contents. It could not exist as an object in itself without the pre-condition of the existing museum around it: indeed it was seen, in a way true to the principles of the Museum's founder Henry Cole, as an architectural demonstration of contemporary craft skills.

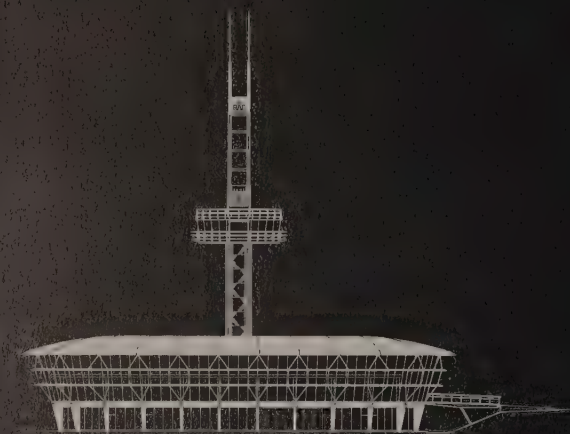
This is why it would now be instructive to see Nicholas Grimshaw & Partners build a technically and aesthetically-demanding building such as a theatre, opera house or concert hall. Apart from an entry in the abortive competition for a Bristol Centre for the Performing Arts, the auditorium-based performance building is one of the few building types still unrepresented in the practice's portfolio, and would perhaps satisfy them most in the next stage of their development. The Grimshaw architectural vocabulary has evolved over three decades of steadily richer and more complex buildings of an increasingly public and celebratory nature, just as the practice itself has refined its sense of balance and co-operative endeavour.

Despite the very diverse portfolio of projects, you

can always recognize the authorship of an NGP building. Partly this is to do with the way the buildings are put together. There is that craft aspect involving, among much else, the design of individual components, often unique to just one building. Secondly, it is to do with the pedigree. There is a discernible line of development, a steady evolution, from the earliest buildings to the latest. There are ways of wrapping skin round structure, ways of creating free-flowing internal spaces, ways of supporting sheer glass, ways of achieving large clear spans. There is a clear sense that a building must be able to change over time, to be adapted, extended, perhaps given over to completely different uses, that its social purposes come first.

The fact that the design response is so distinct, coupled with an increasing air of what might be termed 'celebration' in the expression of function, helps to explain why NGP has become an international force. In the years since Waterloo, NGP has moved without fuss or fanfare onto centre stage. It competes for and wins commissions at the highest level, in the most sensitive locations. The familiar bite and determination is now receiving due recognition. Unlike some of their peers, there is no sense of complacency. More important than international success is the fact that these architects spring surprises and can confound expectations. They are still explorers.



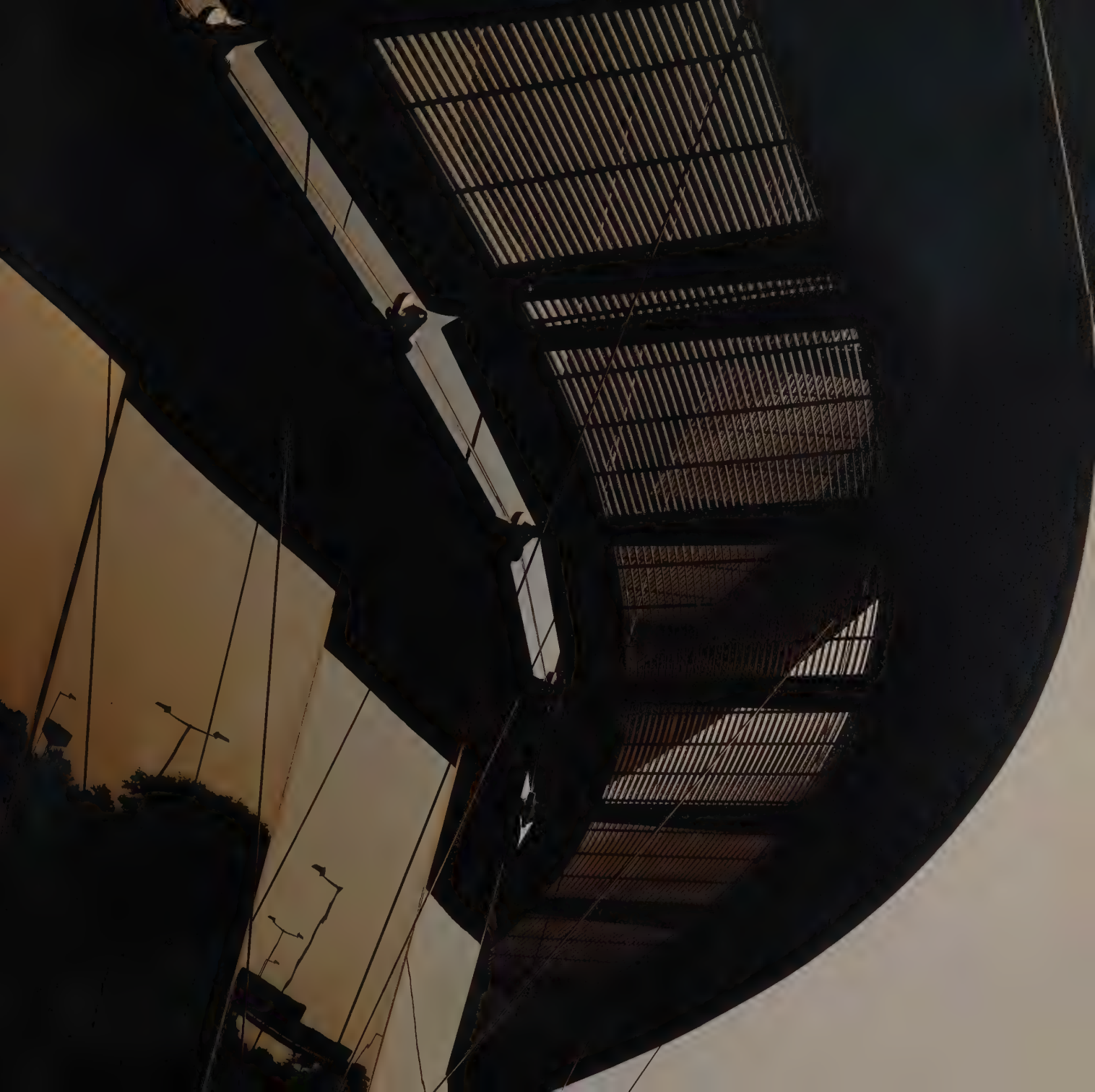


RAC Regional Headquarters, Bristol, 1992-94

The site is on one of the biggest motorway interchanges in the country – a kind of Piccadilly Circus for holidaymakers. Driving up and down these motorways to get a feeling for the site, we soon realized that a low building would flash past in a second, whereas a tower would be seen from a distance and would act as a focal point. The tower also had a double function, with its occupants being able to see 15 km in any direction to check the movement of traffic.

The building represents something of a social experiment. People enter at the middle floor and therefore only need to travel up or down one floor to get to where they want to be. We discouraged the use of lifts by providing a series of stairs and bridges in the atrium, and it soon became evident that the circulation space has great value as a social space in the building.

The building has also allowed us to show off our green credentials. Its compact shape, wide overhangs, efficient use of materials and energy recycling have all allowed us to score an energy rating of 80 per cent. 'Not bad for a first try.' **NG**

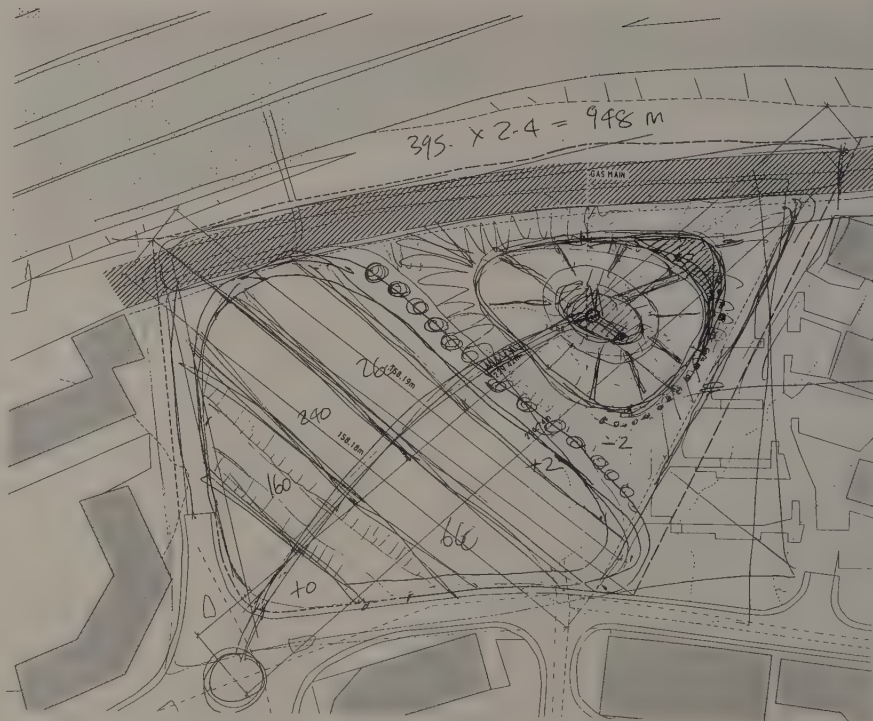




Previous page
Detail of facade with
sun-shading louvres which
double as maintenance
walkways.

Left: Development model
showing an earlier version of
the secondary structure for
the outward-leaning glazing.

An early Nick Grimshaw
sketch showing how the
building responds to its site
near the intersection of the
M4 and M5 motorways.



A design for the motorway age, prominently sited near the intersection of the M4 and M5, this building serves to mark the presence of one of Britain's oldest motoring organizations, originally the Royal Automobile Club. It is a 24-hour call centre handling the RAC's rescue services, and also provides office space for many of its sales and marketing operations. This is a thoroughly modern building, yet it revisits one of the architectural concerns of an earlier age: the inter-war period, when buildings were first designed to be read at speed. Then, factories built along radial routes out of cities seized the opportunity to advertise their wares architecturally through the style known as 'moderne'. The RAC Regional Headquarters achieves much the same effect by more sophisticated means.

At first glance, it is stylistically related to the earlier Western Morning News building at Plymouth, and indeed there are similarities: the outward-leaning curved glazing; the raised conning tower of the observation platform; the dramatic atrium serving as circulation for the perimeter offices. But there are also many differences; the RAC is monofunctional, not an office-industrial hybrid. Its plan is symmetrical – a cam-like rounded triangle rather than the boat-shape of its predecessor. Most notably, the structure at the RAC is downplayed and internalized, while at Western Morning News, one of the principal aesthetic determinants was the rhythm of the great external curving 'tusks'.

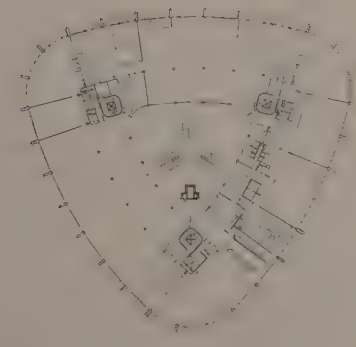
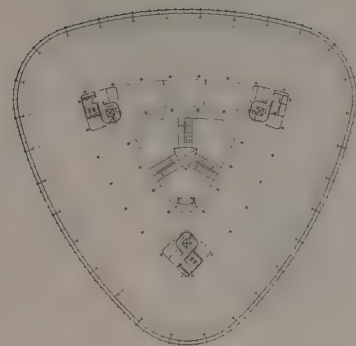




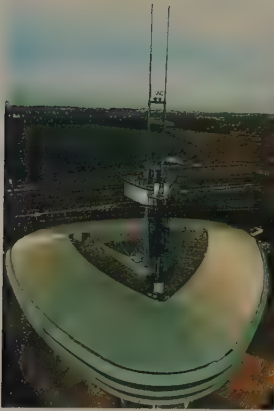


Night view looking south
at the 24-hour operations
centre in use.

From above: first-floor,
ground and lower-ground
floor plans.



Aerial view taken just after completion.

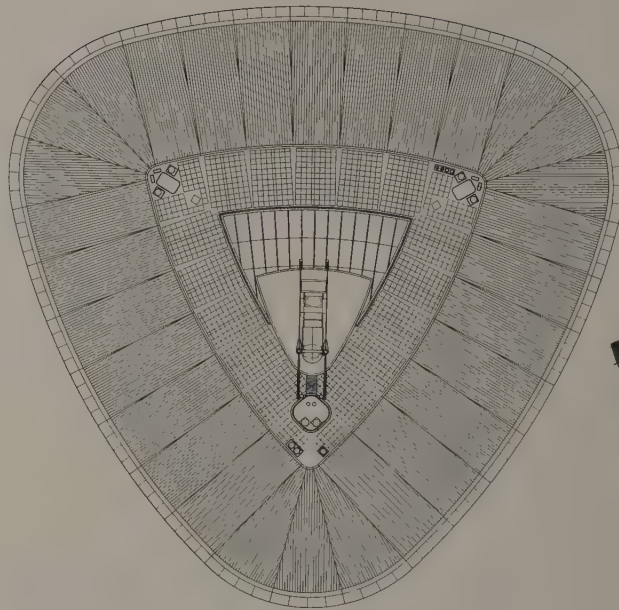


The 'crow's nest' observation gallery.

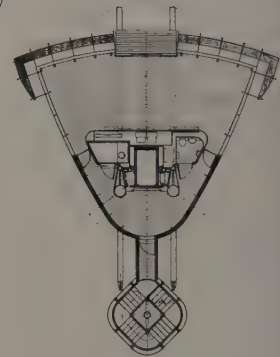
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Although the two buildings are both effectively three-storey, their proportions differ. The twin slender spires of the RAC building rise well above the elevated customer visit room, which itself is placed much higher than the equivalent boardroom at Plymouth. Likewise, the 'hull' appears to be lower than its older colleague. This is partly because the RAC Regional Headquarters is sunk into a landscaped bowl (while the WMN is on a hillside), partly that the fully-glazed facade does not drop right to the ground but is jettied out from a basement level of smooth, leaning concrete pillars; but also it is a visual trick. The building is given a horizontal emphasis, with bands of sun-shading louvres doubling as maintenance walkways. This contrasts sharply with the verticality of the 'tusks' at WMN, which project above eaves level. In sum, the RAC is an exercise in architectural refinement, of a promising plan form that has been developed very considerably in elevation.

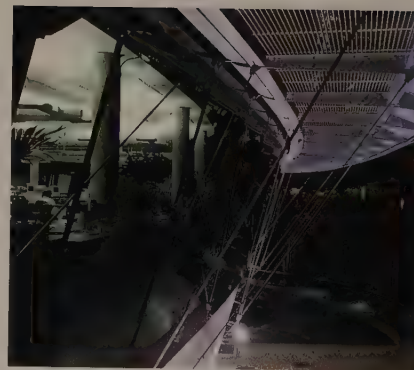
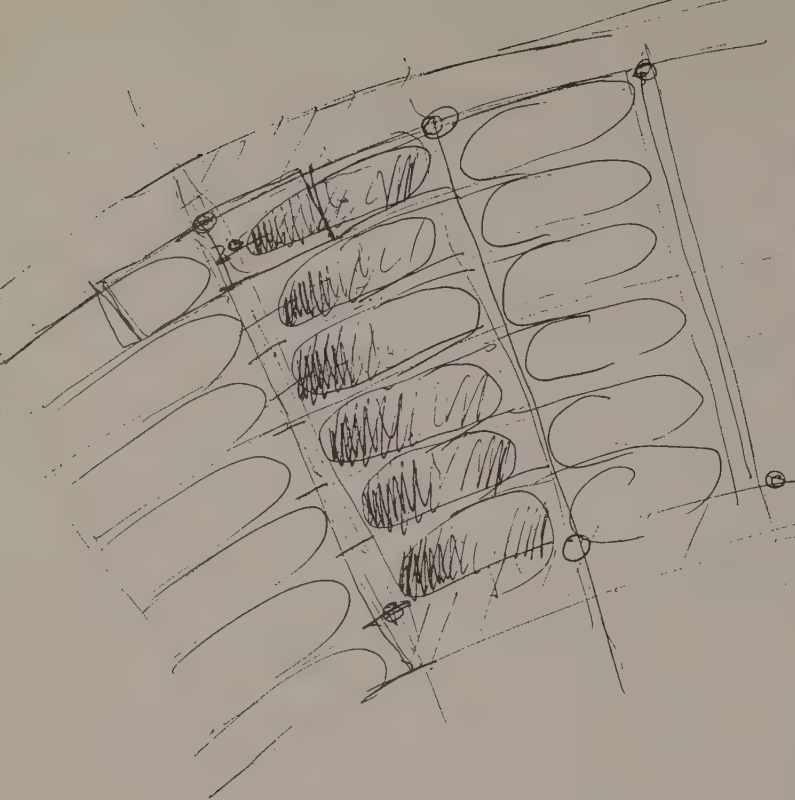
The RAC's need for a landmark building was simply to advertise its presence at this busy intersection: the physical presence of the building implies that the organization is watching over its charges. Otherwise, its back-office function could have been housed in any standard business-park building of the kind to be found at all such locations – and there are plenty of the genre at Bradley Stoke. In architectural terms, however, NGP was taking a broader view: the mast of their building serves to mark the junction, while the rounded shape of the hull responds to the



Plans of roof and observation gallery.







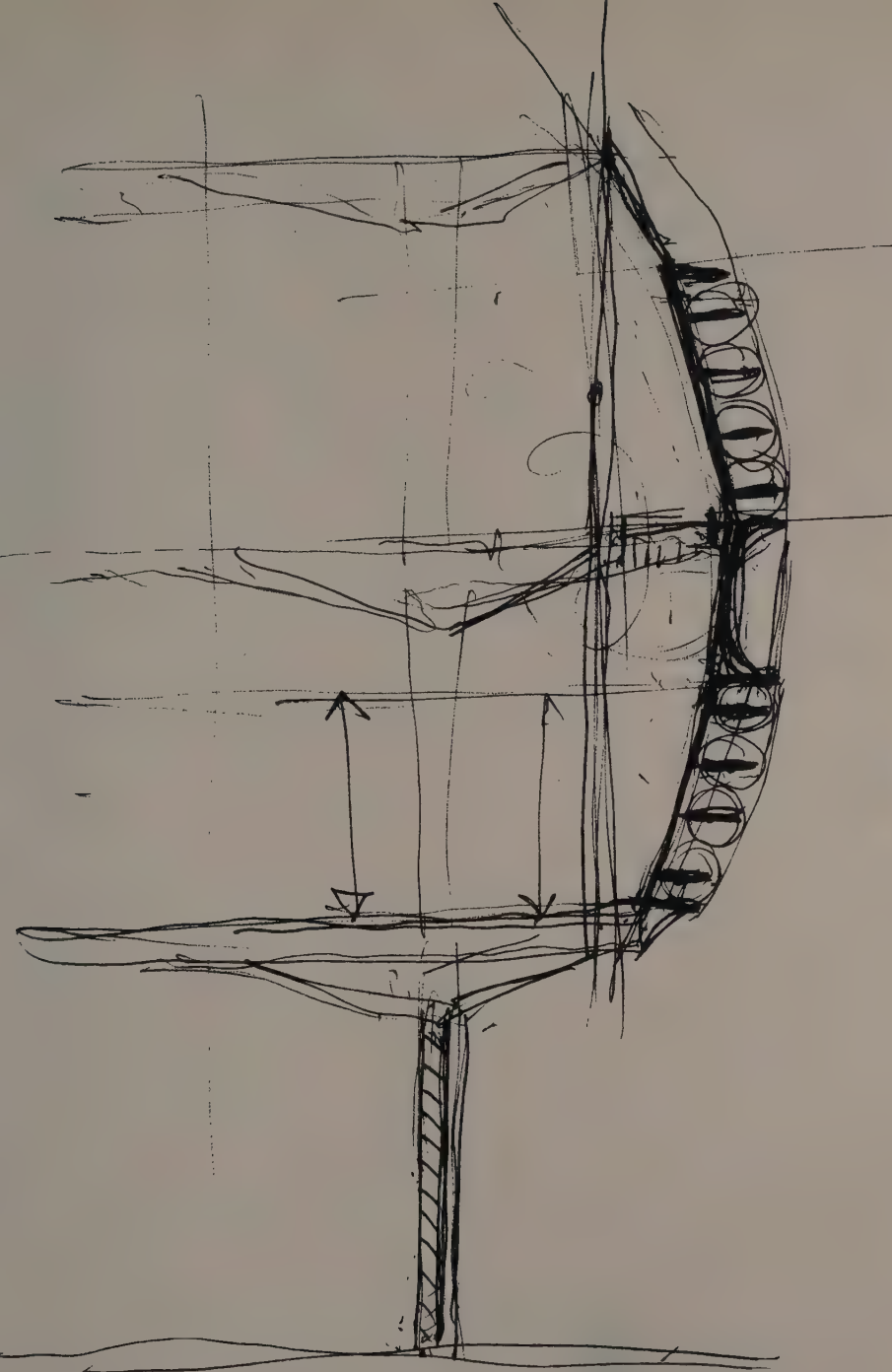
At night the building's envelope becomes transparent.

Left: Nick Grimshaw's sketches of the *in situ* coffered ceiling, which was designed in conjunction with an uplighter to reflect light onto the desks below.

vehicular movement constantly taking place around it. Beyond the needs of the client, there was the need to design a suitable landmark for this form of travel, a recognizable locator on the map of the UK.

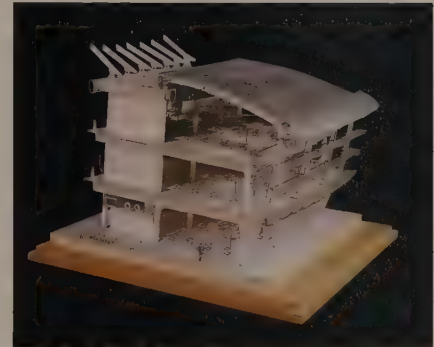
For this reason, the building is set quite apart from its neighbours, pushed right up into the most prominent corner of its two-hectare site – allowing more extensive landscaping than usual. This landscaped bowl, with its crescent-shaped pond, provides an agreeable microclimate. The staff restaurant on the sheltered south side opens out onto the 'moon' pond and 'sun' gardens, a reference by the landscape architects, Edwards Gale, to the round-the-clock nature of the building's function. The landscaping plan, and the easily-cleaned building finishes, were at least partly determined by the assumption that this location would suffer badly from air pollution – but tests showed the site to be less polluted than most city centres.

A bridge link takes you from the car park, across the moat of the gardens and service road, to the main entrance (on the middle, *piano nobile* level) which is cut into the dark-tinted glass of the facade. There is a short moment of compression through the entrance lobby before you are released into the full-height space of the central atrium with its busy, intersecting staircases. To one side of this atrium, a scenic lift takes you up through the roof and into the observation gallery. This was intended as a treat for the RAC's customers but, somewhat disappointingly, it was



Nick Grimshaw early sketch showing relationships of structural floor plates and the building's skin.

Sectional-model which was constructed as part of the design development process.

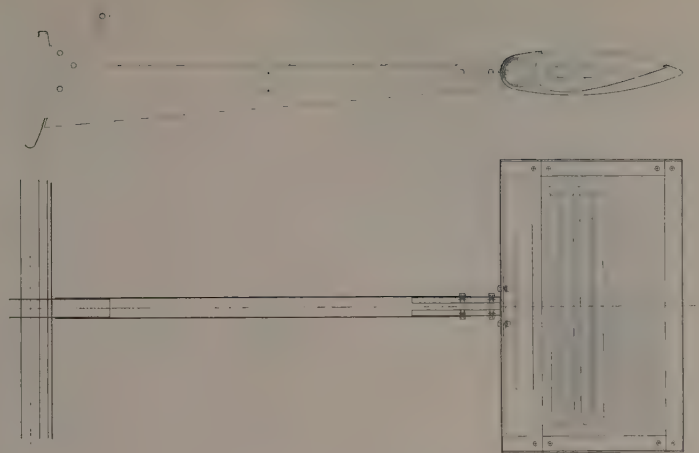






The specially-designed uplighters which cantilever like wings from a central duct.

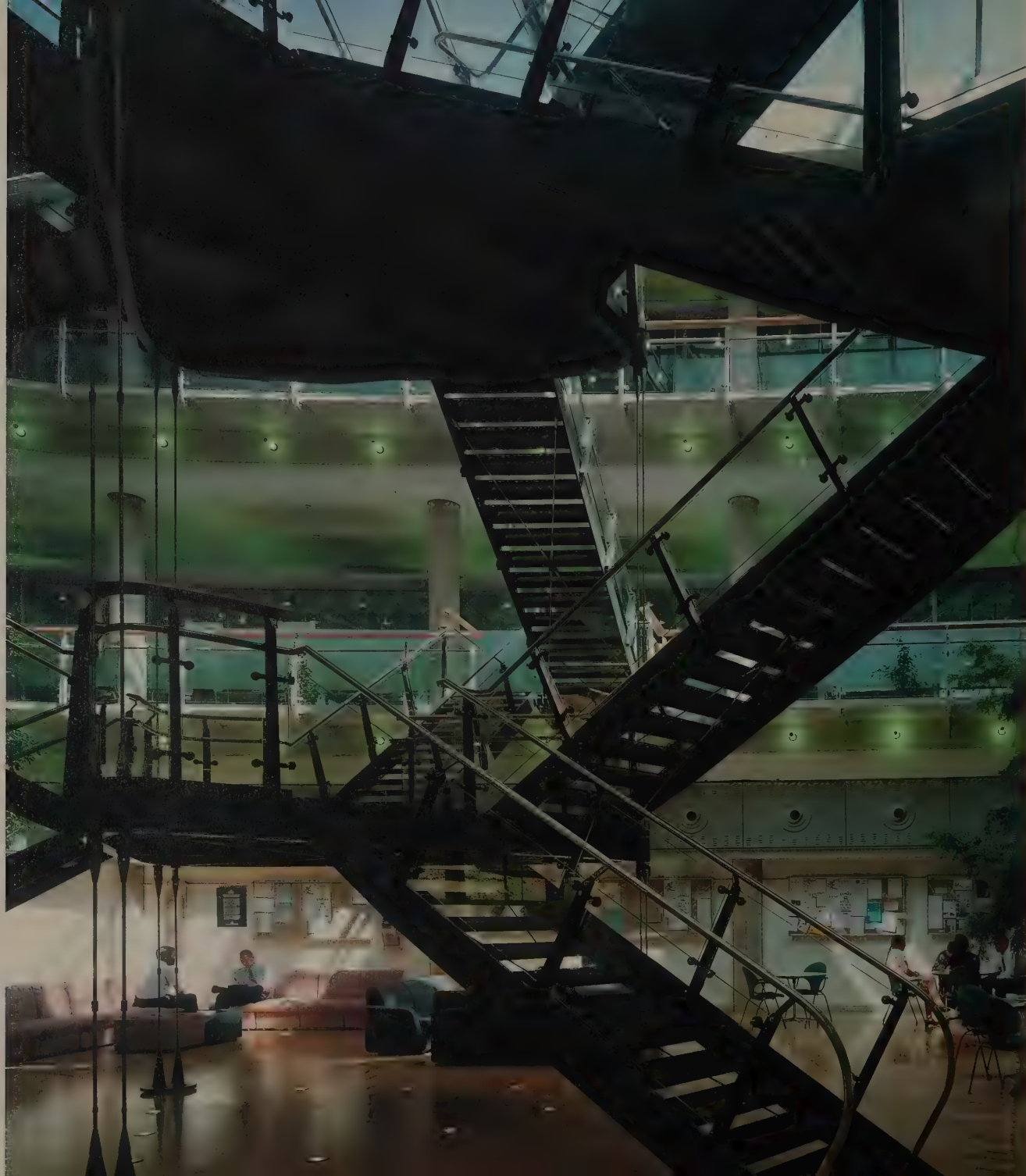
Entrance level office spaces with circulation zone alongside the perimeter glazing.

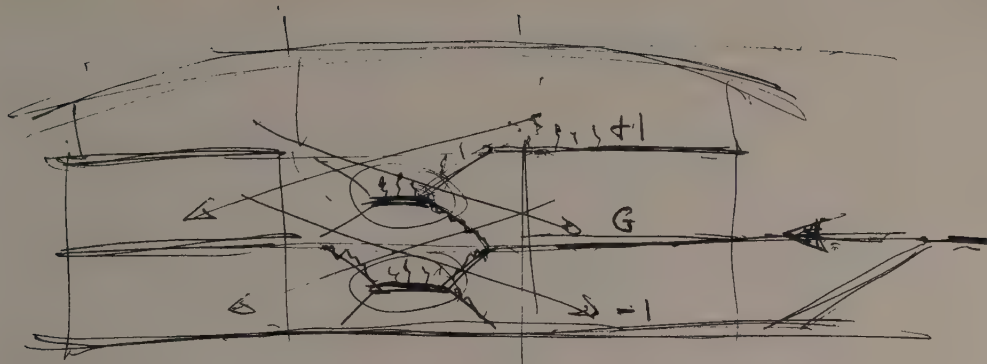


soon turned into a conference room with thick blackout curtains, a function quite at odds with its elevated position. A separately articulated, glass-walled escape stair from the gallery functions as a ventilation funnel for smoke in the event of fire. A displacement ventilation/cooling system is employed, with the facility to reclaim heat and humidity from the exhaust air when required. Inside the main building, the smooth, oval-coffered, moulded slabs of the concrete ceilings serve as a heat sink, to iron out temperature fluctuations, and as a reflective surface for purpose-designed uplighters.

In conventional offices, workstations are laid out up to the perimeter glazing with circulation space around the edge of the atrium. Here, this practice is reversed; the atrium is considered the prime 'edge' and glazed meeting rooms are arranged around it. Circulation runs around the external wall instead. Service cores are set out at the three corners of the plan. This arrangement allows everyone a view from their workstations, either outwards or inwards. The central atrium, with its sociable stairs and landings, is an especially important aspect of the design since it actively encourages visual contact and chance meetings, giving a sense of cohesion and dynamism to the organization.

The building is a structure within a structure. Its office floors consist of an orthogonal, post-and-beam, exposed concrete construction, which sits within the sloping glass carapace – itself held in place by a grid pattern of dark grey, cast-steel,





Nick Grimshaw sketch demonstrating the idea of the social circulation space.

Intersecting staircases in the atrium, viewed from lower-ground level.

tapering tubular members. Thus the building's fragile-seeming shell of silicon-jointed, trapezoidal glass panels, rising to a curved steel roof softened with a tensioned-fabric soffit, is a loose-fit element, moving away from the edge of the working floors as it rises. The angles of the glazing and of the computer screens are calculated to avoid distracting reflections.

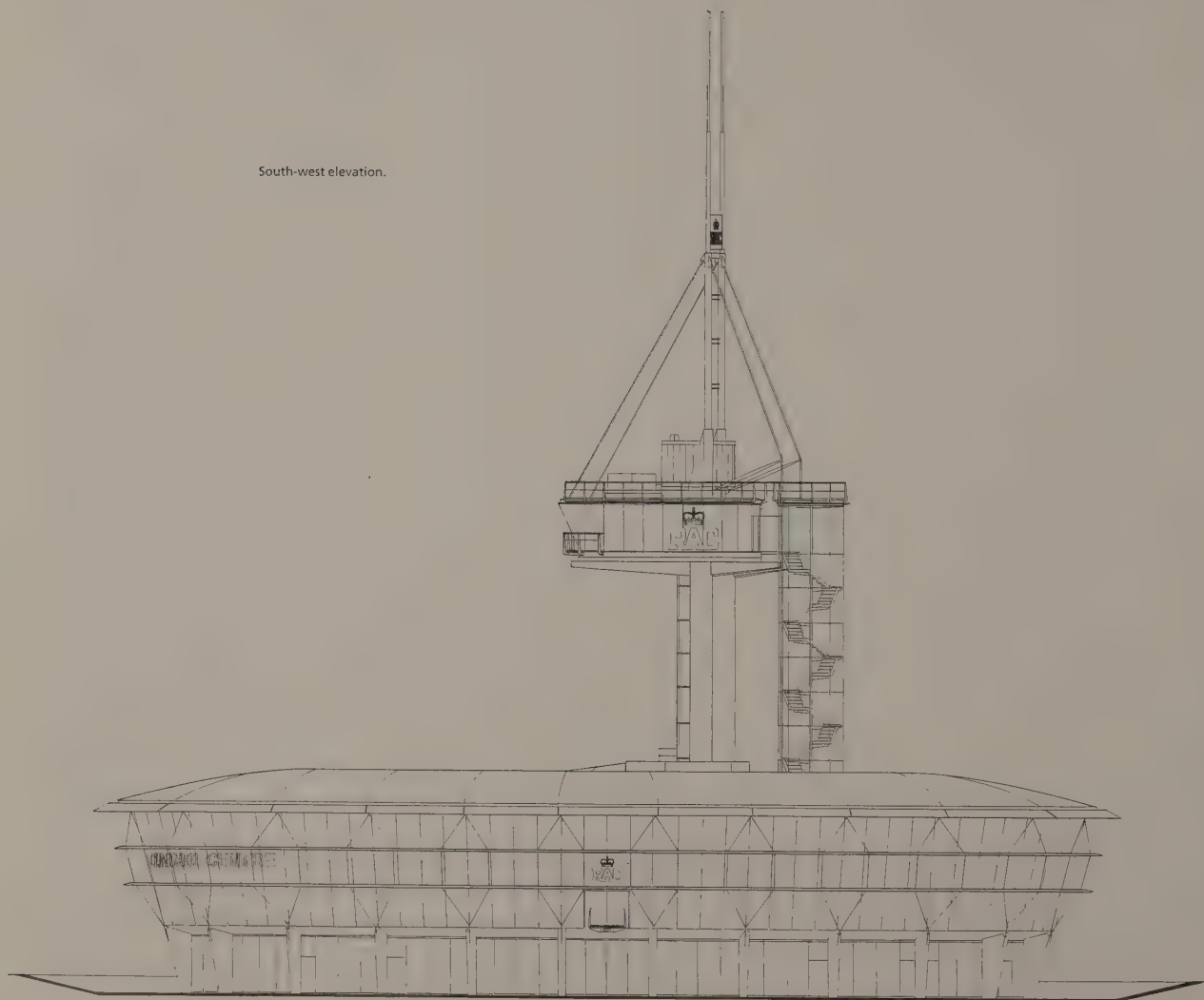
The RAC Regional Headquarters follows in the interesting tradition of bespoke office buildings for powerful organizations with a clear public image. The RAC saw this project as an investment rather than merely as a piece of necessary expenditure. This was a £10.6 million building providing 7,000m² of office space, finished to a very high standard, ambitiously landscaped, and incorporating elements – such as the twin 65m-high masts supporting the observation gallery – that a bottom-line accountant might well have been tempted to remove. Landmark status, after all, is not something that ever appears as an asset on any balance sheet. Similarly, it is very clearly a single-owner building, designed to work in a particular way, and which would suffer badly were it ever to be partitioned up by another tenant.

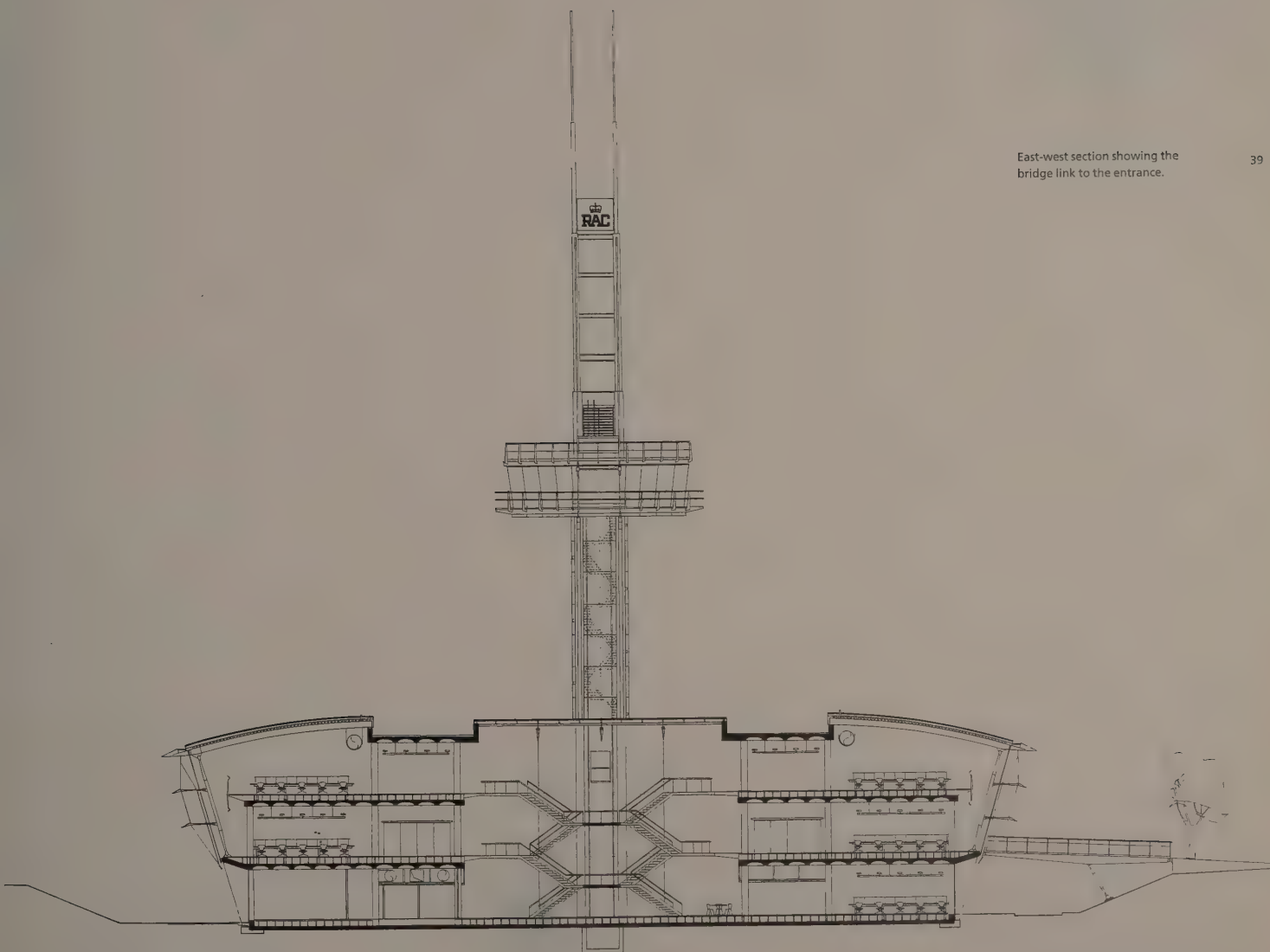
One suspects that, were this building to have been commissioned a few years later – when the RAC had decided to sell off its motoring services division – a very different approach would have been needed. Just how different is apparent from the next example of this building type from the practice: the Orange Call Centre in Darlington.



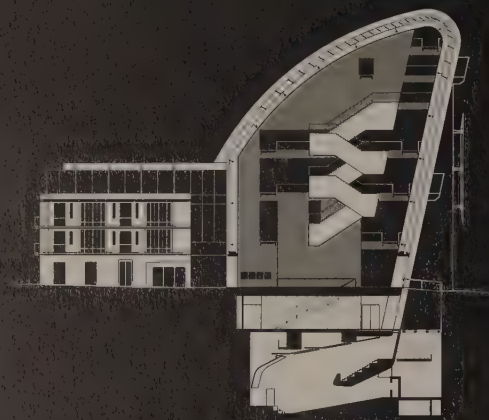
One of the staircase landings.

South-west elevation.





East-west section showing the
bridge link to the entrance.



**Caixa Galicia Foundation Building,
La Coruña, Spain, 1996–2003**

It was very exciting to win this competition. An arts centre was a new field for us and we found the site particularly inspiring – a gap in a long parade of buildings facing a swathe of formal garden bordering the harbour. This area of town covers a narrow spit of land, and from the site on the sheltered southern side one can faintly hear the waves thundering on the beach to the north. Perhaps this is what inspired the section of the building: as if a wave had escaped from the northern shore and rolled up on the harbour front.

Our clients wanted their building to be a focal point – a symbol of their interest in the culture of the region. An early idea was to back-project the entire collection onto the facade in an hour-long digital show, so that people sitting in the park would be drawn into the building to see the real thing. Another idea was that the building should act as a funnel, drawing people from the narrow back streets through the building and out to the wide open spaces of the park.

However this building emerges, it will without doubt be a new focus for the arts in a town which is beginning to show a great interest in displaying itself to the world. **NG**



The Caixa Galicia is a regional, co-operatively-run bank based in the port of La Coruña on the north-western coast of Spain, in the region from which it takes its name. The Caixa, having amassed a large collection of mainly Galician art over the years, is to put this on public display in a building that will also function as a meeting and learning centre for the city – the Fundación Caixa Galicia. A tight urban site in the historic centre of the city was acquired, and an international architectural competition was held to determine the design.

The winning scheme by NGP, although unique in form, is a further example of the practice's expanding portfolio of commissions within a sensitive historic context. In particular, this concerns the response to the surrounding buildings and the way the design reinterprets some of the familiar elements of this ancient city. Thus, like the very different Bath Spa project, the Fundación Caixa Galicia may be seen as being directly related to the unbuilt Victoria & Albert Museum 'Boilerhouse' project in London.

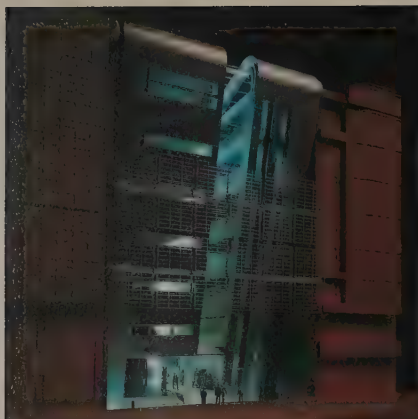
Key to this approach is the layering of the facade in such a way as to first erode the existing street frontage – the strongly outwardly-sloping, metal-clad facade with its rhomboidal, panoramic glass lifts – and then to superimpose a new layer that reinstates the street line by means of a latticework glazed screen. The ingenuity of this is the way it draws upon one of the characteristic vernacular details of the city – the glass-fronted *galerías*, with their grids of glazing. At first, the screen was envisaged as a liquid-crystal display medium. This was later changed to a simpler back-projection system that allows better transparency by day.

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Detail of the glazed screen which demarcates the street line. Images can be back-projected on to this surface from within the building.

Left: the latticework screen becomes almost transparent when not being used to project imagery.

Below: Nick Grimshaw sketch showing the relationship of the building to the street and the strip of public gardens beyond which lies the harbour.



Aerial view of model showing adjacent buildings and the glazed roof of the atrium street.



Digital image of central atrium and gallery spaces.



The outwardly-tilting front elevation is a sun-shading device that also brings daylight into the below-ground levels. The tilted, paraboloid longitudinal section of the building is a way of moving seamlessly from the large scale of the Calle Cantón Grande, overlooking public gardens at the front, to the intimate scale of the Calle de la Estrella at the back, in its busy network of little streets and alleys. This abrupt change of emphasis also provides an urbanistic opportunity: to make the new building function as a public arcade between the two areas. Accordingly, it is longitudinally split with a long, narrow, offset atrium street containing cafés and shops at ground level, overlooked by glass bridges connecting the exhibition areas above. As well as lifts, a sculptural, double-helix stair provides vertical circulation through the atrium. This functions as a space-saving device since the double helix allows a public stair to be combined with an enclosed escape stair within the same footprint.

Much effort has gone into providing the necessary space for permanent and temporary galleries, public and retail space, while simultaneously respecting the massing of the surrounding buildings by meeting their cornice lines and floor levels. To achieve this, the building is something of an iceberg, with four levels below ground in addition to the seven above on the main elevation. The permanent collection is housed on the first, second and third floors above ground to one side of the atrium street, and a rear triple-height exhibition space rising into the sharply-curving roof. All these spaces are day-lit with diffuse light through a translucent glass screen to the atrium. To the rear is a





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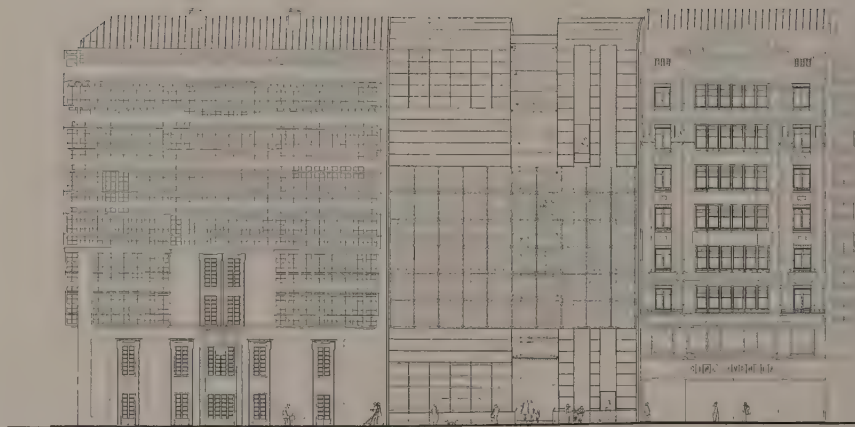
This early model was made in two halves – one either side of the atrium – so it can be opened up to show the arrangement of internal spaces.

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four-storey administration block, topped by a 'glass box' sculpture gallery. At the front, the re-entrant slope of the principal facade makes possible a broad area of horizontal glazing at ground level. Traversed by an entrance bridge, this brings daylight into two of the lower levels. The first level is the temporary gallery, opening out onto the glass sculpture court; the second is the double-height vestibule to the 300-seat auditorium. The lowest basement level is for services and needs no daylight.

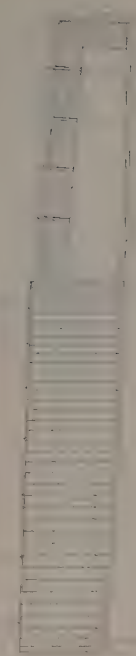
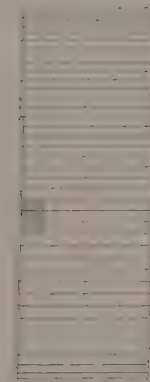
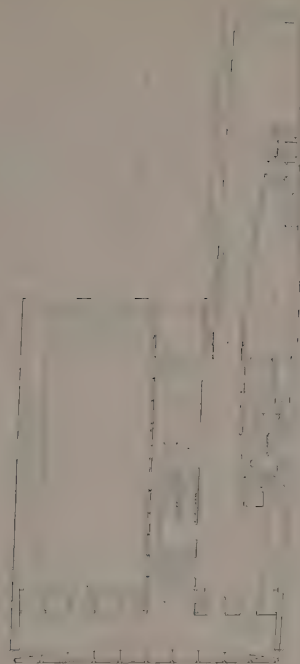
In this way, the most public functions of the building are arranged just above and just below the atrium street. The further up and down the building you proceed, the more private the functions become: thus the very top floors at the front, peeping over the top of the external glass screen, are devoted to meeting rooms and offices. However, these levels overlook the triple-height rear exhibition space and are, in turn, viewed from there, so all levels partake of the public life of the building.

The Fundación Caixa Galicia is a very significant project in the NGP oeuvre as both the first large art gallery commission for the practice, and the first permanent building in Spain for a Spanish client (NGP's earlier foray into Spain having been the British Pavilion at Expo 92 in Seville). It is also a sophisticated exercise in urbanism that simultaneously learns from and informs the increasingly city-centred work of the practice.



Elevation to Cantón Grande showing the glass-fronted 'galleries' of adjacent buildings.

From above, left to right:
Second floor, roof, basement
level 3 and ground floor plans.





Ludwig Erhard Haus, Berlin, 1991–93

This project came about through a competition run by the German Chamber of Trade and Commerce. The other competitors were six Berlin architects, three architects from elsewhere in Germany and three foreign architects. We thought local knowledge would prevail, and that we didn't have much of a chance.

I think this was probably the reason why we really pushed the boat out, designing a long, low building which occupied the whole of the irregularly-shaped site. This form allowed us to achieve floor space requirements without penetrating the Berlin skyline. It also produced an irregular ribcage type of structure.

Although somewhat modified from the competition scheme, the essential concepts have survived in the finished building. Floor plates are hung from the wide-spanning rib structure which allows vast column-free spaces. The ground floor spaces in particular are designed to be reconfigured when required. They also reflect the democratic ideal of a concourse offering spectacular views of the interior and pedestrian access. **NG**

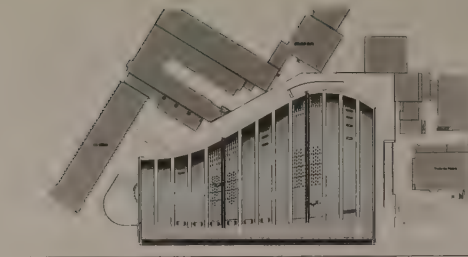




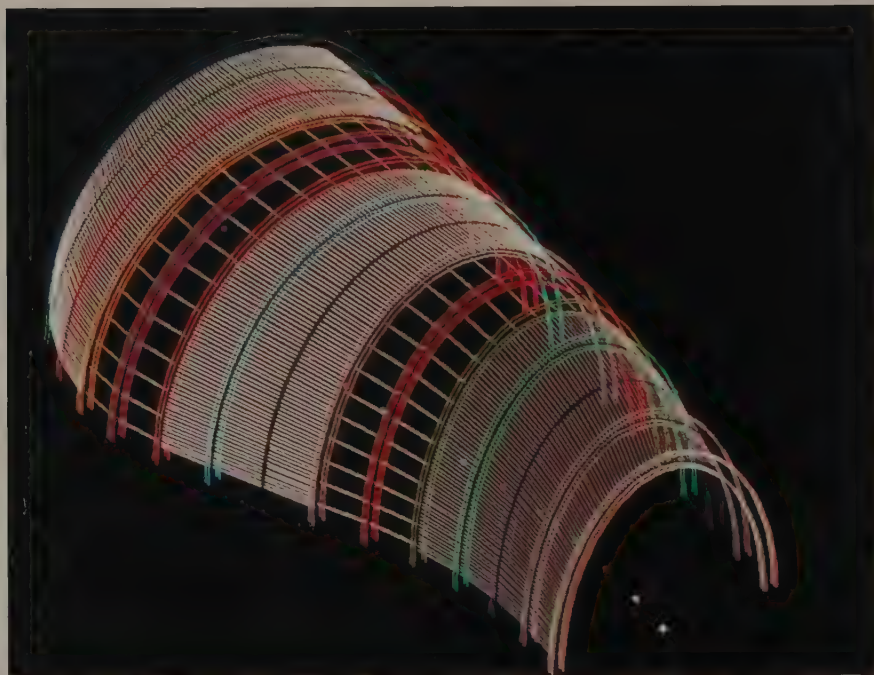
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Detail of Fasanenstrasse
facade.

Left: the curved ribcage of
LEH is now part of the Berlin
skyline.

Right: site plan



Computer-generated
structural model of the
building's 'carapace'.



The project officially known as Ludwig Erhard Haus – and unofficially as 'the Armadillo' – was instrumental in keeping NGP on course, both in advancing the practice's architecture and, equally fundamentally, in providing some stability during the last part of the British economic recession of the early 1990s. It took over from the Waterloo International Rail Terminal as the key project in the office, helping to keep the practice buoyant, and shaping its direction.

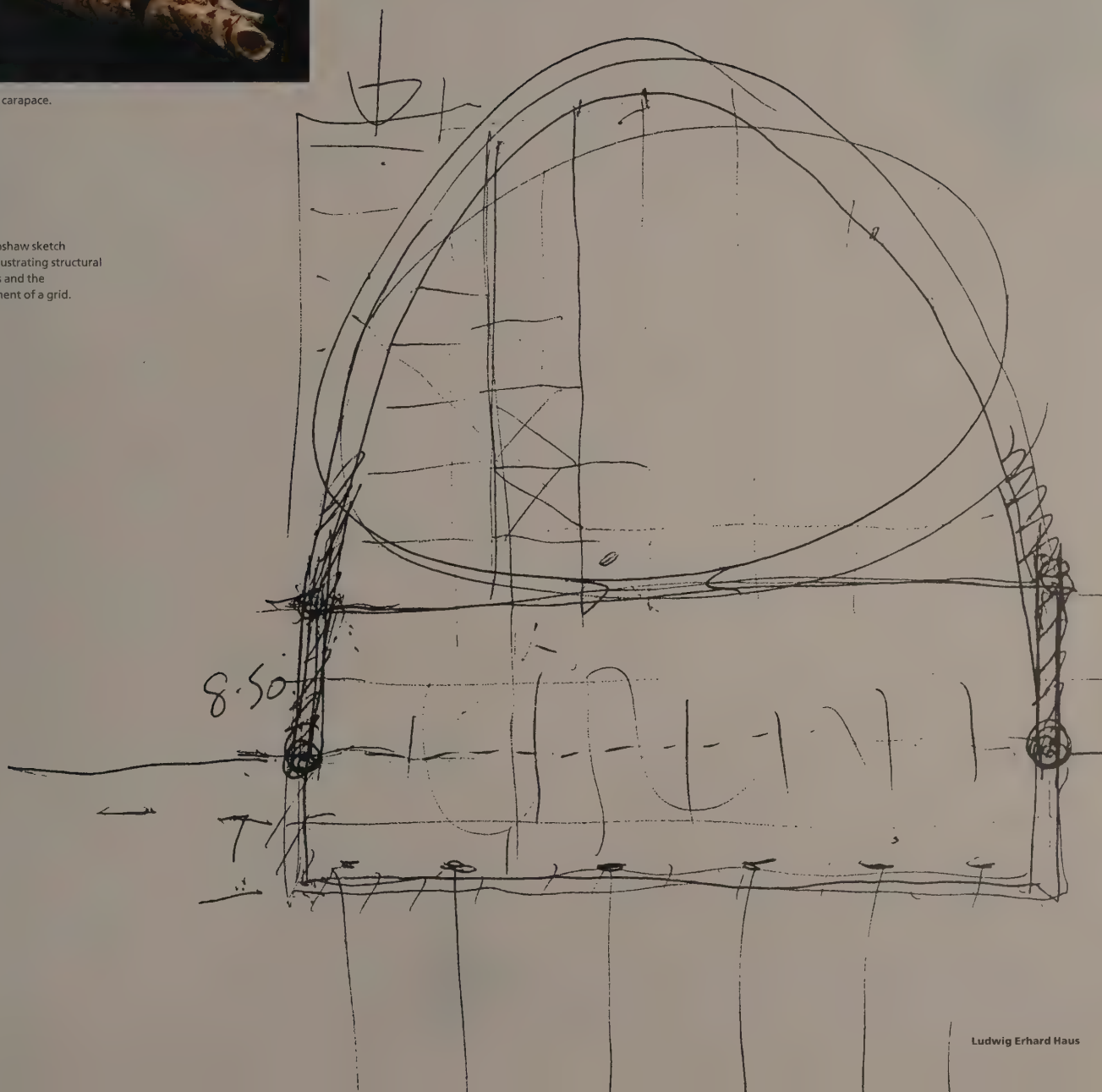
Ludwig Erhard Haus, named after the brilliant post-war economics minister and chancellor, is a financial and commercial services centre for the Chamber of Trade and Commerce. The project grew out of the first flush of optimism following the collapse of the Berlin Wall, in the knowledge that Berlin would once again become an internationally important trading centre. The design developed and changed enormously in the years following the competition win in 1991 – when its organic form, like the ribcage of a huge fish or reptile, was in marked contrast to the high-rise tower approach taken by many of the other entrants. There then commenced a long process of negotiation with the famously conservative Berlin city planners.

At the time, the city architect was Hans Stimmann, a man with very firm ideas on the sanctity of the large, low, essentially nineteenth-century Berlin city block with its continuous street frontage and uniform eaves height. His department insisted that the building should be orthogonal to the street line, and that nothing above the standard eaves line should be visible from the street. The original plans showed the



A lobster carapace.

Nick Grimshaw sketch section illustrating structural principles and the development of a grid.



building curving inwards away from the street edge at the north end of Fasanenstrasse, picking up the end of the existing IHK building set at an angle on Hardenbergstrasse, and creating a public open space in the process. This was not allowed. Paradoxically, the competition design's depiction of a 'tail' of structure sweeping along the street edge to the south, thus urbanizing existing left-over space, was also disallowed. Later designs had the street elevation leaning outwards slightly: this the clients vetoed in the interests of maximizing lettable space, though slanted struts at each end of the facade remain as a memory of the idea. So, in the end, LEH ended up with an orthogonal and vertical glass facade, albeit by no means a conventional one, adhering strictly to the pavement edge.

Originally, there were to have been two entirely separate structural systems placed together: lean-to hoops of differing sizes at the rear to take in the site irregularities and a butterfly-truss structure, supported on single columns of varying heights, running along the street. The inward arms of the trusses would have roofed the atrium and connected to the hooped rear section: the outward arms would have acted as suspension jibs for a separate range of offices. In retrospect, this was a rather over-complex solution to the twin constraints of brief and site. The moment the separate street-front structure was abandoned, and the hoops at the rear were brought right over to form arches carrying the entire building, was when the design achieved its best clarity of expression. The arch profile was chosen to sit exactly within the city planners' sightline envelope, so



Left: the thirteenth arch being hoisted into place.



Right: the ribcage under construction.



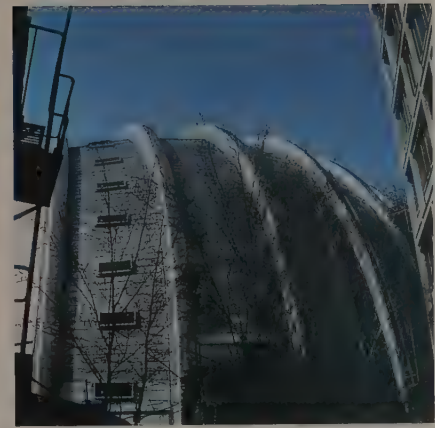




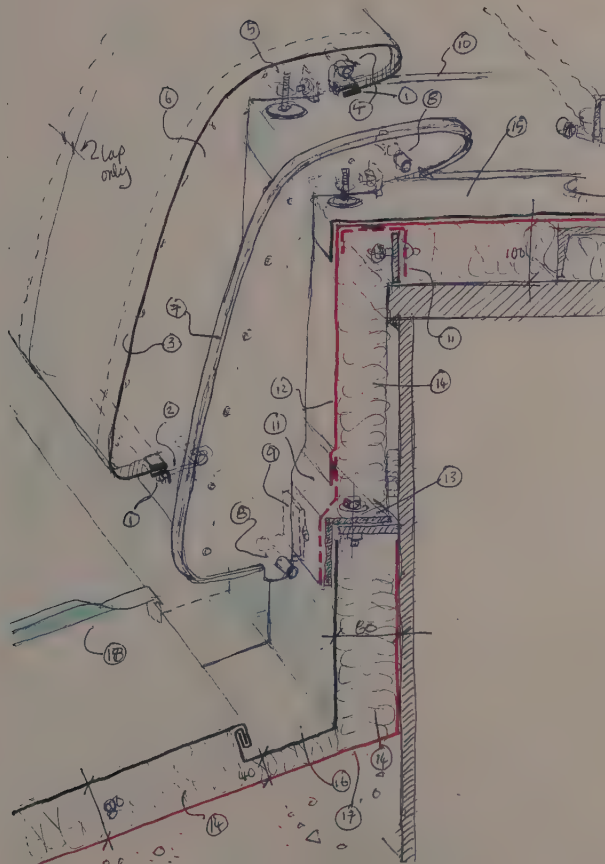
South elevation with the projecting floor plate hangers.

Right: supporting elements for the arch cladding cast in aluminium.

Far right: view from the east.



Neven Sidor early sketch of the LEH arch overcladding.



avoiding the need for complex set-backs while reaching higher than is normally allowed.

The southern half of Fasanenstrasse, where LEH is sited, is an unremarkable short street linking two main roads near Zoo station with the post-war western commercial centre of the previously divided city. At its bottom end are a pair of cultural buildings – a small 1920s cinema and the large Theater des Westens – but these give nothing to the street as they are placed side by side facing onto the main road of Kantstrasse. Therefore, the task of the new building was to forge a new and more cohesive identity for the street.

The drama of LEH is threefold. From either end, the arched form with its floor-hangers is clearly visible. From the street, the well-mannered glass facade, with its sun-seeking, glass solar-shading louvres, hints at something extraordinary – beneath the skirt of the solar facade, the cast stainless-steel clawed feet of the arches form an arcade. It is only upon entering at either end of the building, however, that the quality of the internal space becomes apparent. In here there is a new pedestrian street with a very un-Stimmann-like, undulating built edge, complete with a glass-canopied public restaurant. From this huge lobby, you disperse to the rest of the building – either down to the wide, daylit lobby of the oval conference area, through the back to the smaller oval of the stock exchange, or up to the office levels and business club via a broad, panoramic balcony. From here, you move to the next moment of drama: the building's twin full-height atria, each two arches wide, and each with three aluminium-clad wall-climber lifts like sci-fi sarcophagi rising and falling.



Fasanenstrasse facade with glass solar-shading louvres. The clawed feet of the arches line up to form an arcade.

One of the cast stainless-steel clawed feet in situ.



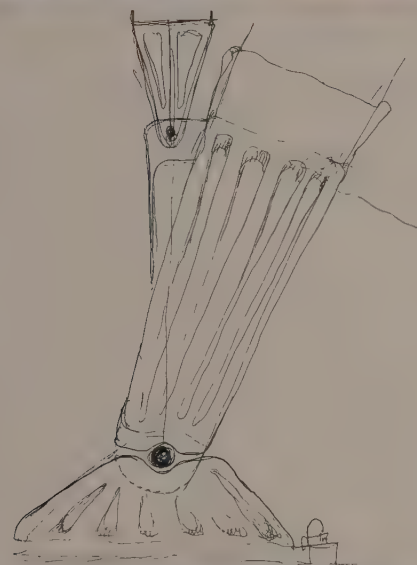
Two further devices enhance the atria. On the floor of the larger one, an oval lantern marks the stock exchange below, from which you can look down at the dealers. The smaller atrium, near the northern end of the building, reveals the sharply-reducing size of the structural arches as the mass of the building scales down. Both atria benefit from very prominent glass-cleaning mechanisms, which rack themselves up the central arch, over the top and down the other side – these are duplicated on the exterior.

Although the atria count as naturally-ventilated outdoor spaces and are deliberately cold in winter (an abundance of automatically-opening glazed sections at low and high levels keeps them cool in summer), the lifts count as interiors which, because of their maple linings, are technically flammable. Consequently, they were, at the time of writing, the only lifts in Europe with their own self-contained sprinkler systems running off pressurized water tanks in each car. The lift-towers and their landings on each floor compose twin clusters of freestanding elements within the suspended structure of the rest of the building. The movement between the two structures is taken up by hinged connecting bridges.

The rear elevation of the building, with its carapace of matt-finished, stainless-steel cladding over the thin-shell concrete roof structure, shows the true anatomy of the Armadillo. Where visible, the arches are clad in greaves of spring-tensioned stainless steel, so allowing for expansion and contraction.

In some of the German-style combi cellular offices (characterized by glazed partitioning), the only thing revealing the true nature of the beast is the strange

Nick Grimshaw design sketch of the foot.



Stainless-steel castings photographed at the foundry.





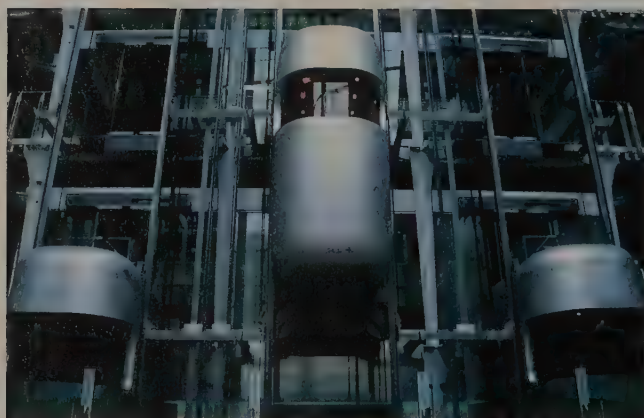


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Interior view towards Theater des Westens. Ground-floor spaces were conceived as an internal street.

Computer-rendered cross section through a lift capsule.

Opposite
View upwards to one of the glazed atria roofs. Lift towers are freestanding elements within the building.



One of the two sets of aluminium-clad wall-climber lifts.

slenderness of the columns, which are of course fire-protected hangers, and the expressive aluminium radiator mouldings used throughout. Elsewhere – such as near the top of the arches, and looking out through either end – there are truly dramatic work spaces. This sequencing of its architectural effects is one of the best achievements of the building. Inside and out, one of the attractions of the Armadillo is the way it reveals itself by degrees rather than all at once. Despite all the angst over its design development, it has succeeded in achieving a double coup: simultaneously conforming to, and subverting, the received idea of the Berlin courtyard block.



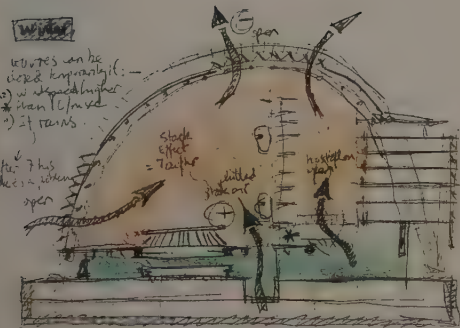
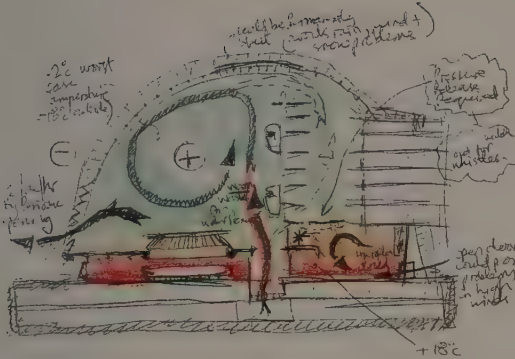


A mechanical maintenance crane which runs along tracks attached to the central arches of the two atria. An internal cherry-picker also runs along tracks on the inner side of the arch.

Overleaf
View from the east.

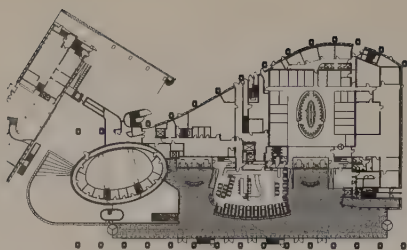
Neven Sidor's sketch illustrating the environmental principles of the atria.

Right: view of the main atrium and floor-plate hangers.

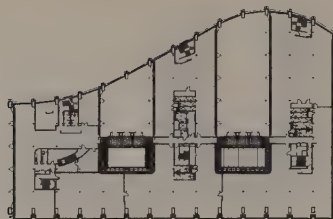




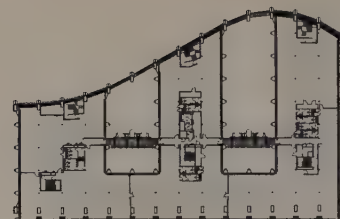




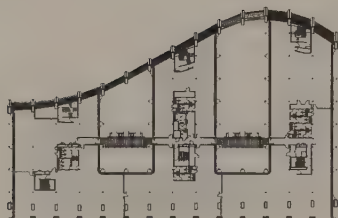
Ground floor plan.



Level two.



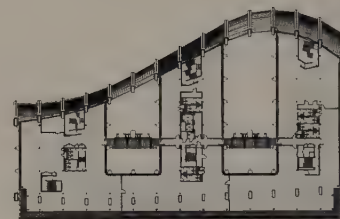
Level three.



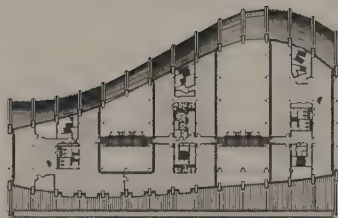
Level four.



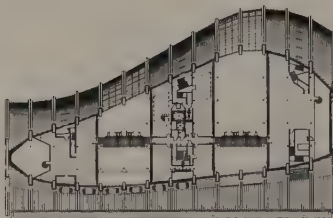
Level five.



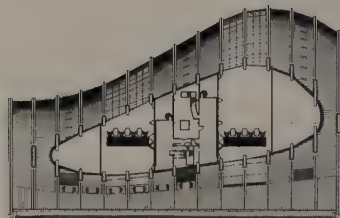
Level six.



Level seven.

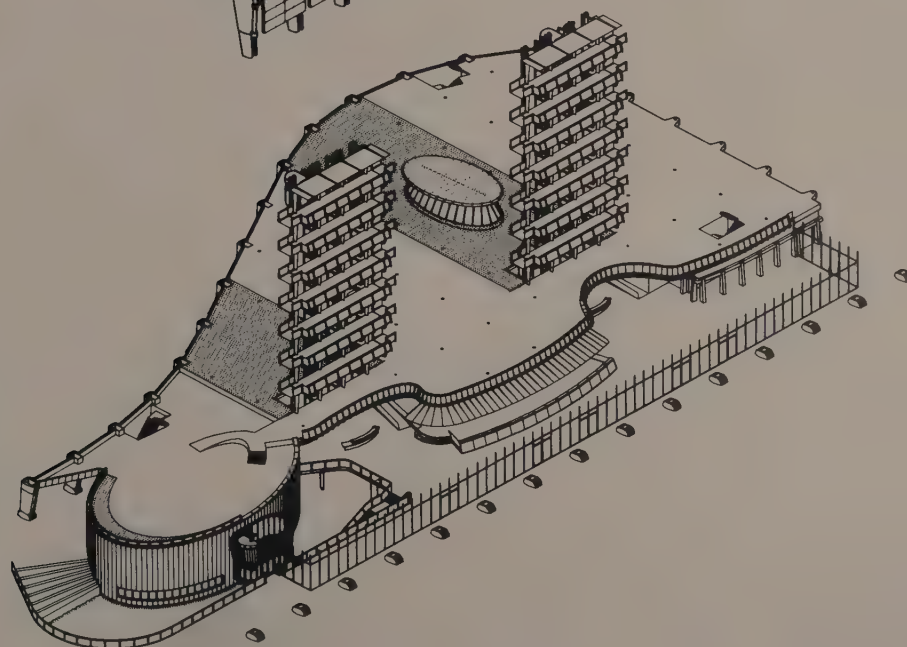
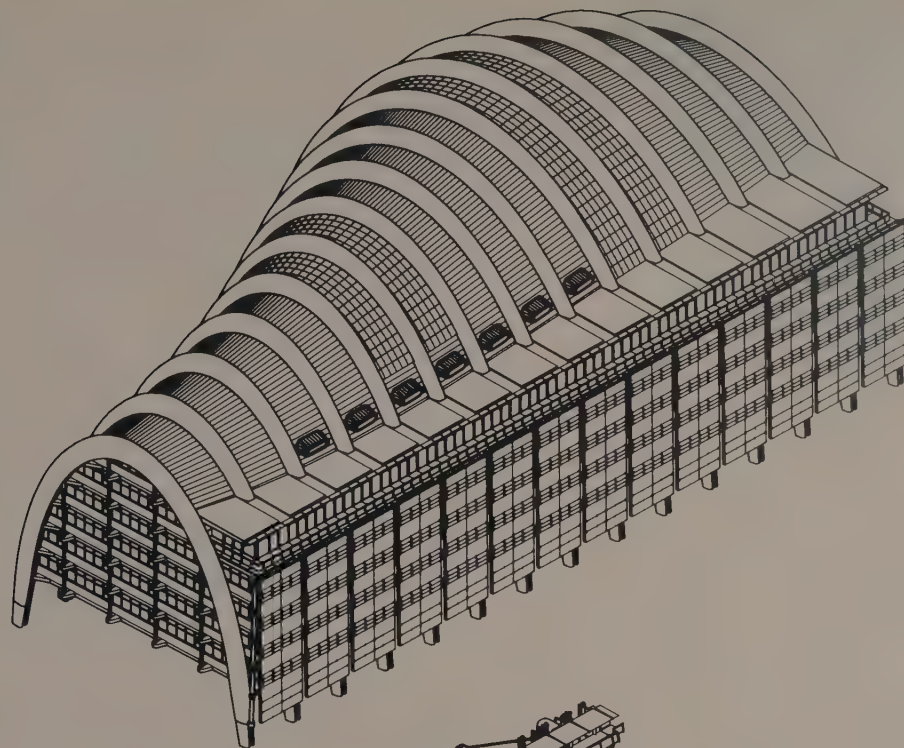


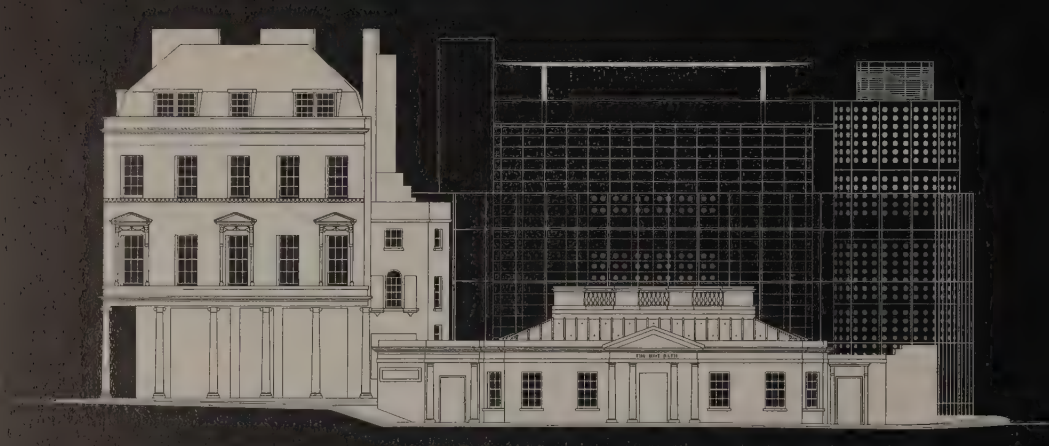
Level eight.



Level nine.

Exploded axonometric
showing the location of
atria and the freestanding
lift towers.





Bath Spa, 1997–2001

'I have always believed that a good modern building should be able to hold its own in any setting. Until the twentieth century, planning control as we know it did not exist; people simply built the best buildings they could using the materials available.

Our site in Bath was once occupied by a derelict municipal swimming pool, so the precedent for leisure was there. Our brief was to build a contemporary spa with hot pools, saunas and treatment rooms. However, we were surrounded by historic buildings. We studied their scale, height, materials and the way the light fell on them and then we designed a wholly modern building. I think it fits in well – a glowing glass enclosure surrounding a solid cube. I can see myself sitting in the roof-top pool overlooking Bath and feeling that we have really done something for the city.' **NG**



Previous page
Detail of computer-rendered
study created at design stage
to present the building in its
historic context.

Detailed view of model,
showing ground floor and
roof-top bathing pools with
steam rooms, and changing
areas on levels in between.



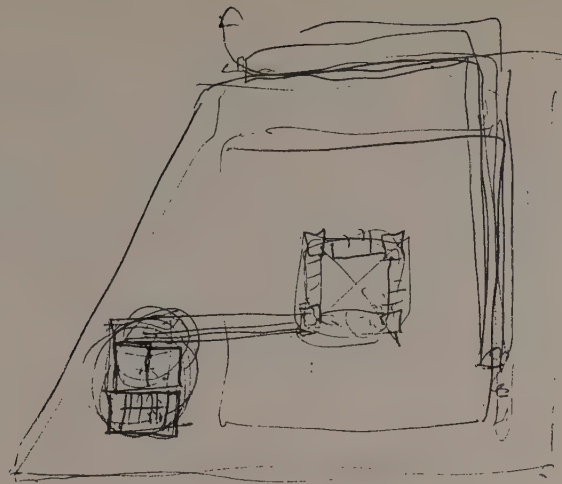
Computer-animated view
at street level.



The city of Bath developed because of its hot mineral springs, first exploited by the Romans. In the eighteenth century, it became a fashionable place of resort and healing, and is still the most complete and glorious example of Georgian city-planning in the UK. The therapeutic properties of the water, for drinking and bathing, continued to be enjoyed right up to the late 1970s, but then the waters fell into disuse. People could visit the Roman and Georgian baths, but for twenty years could not use them as intended. Apart from anything else, this was an extraordinary waste of a natural resource as the hot water from deep underground bubbled up only to drain away unused.

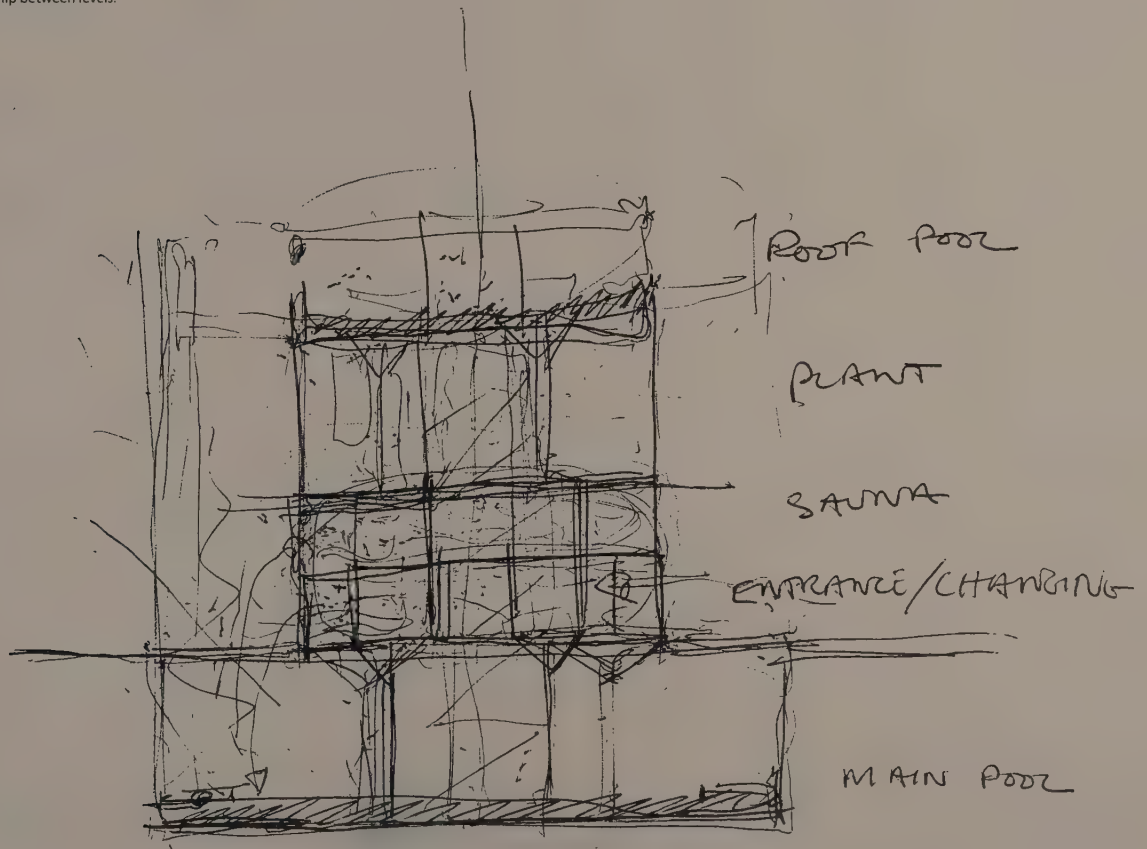
This situation has now been rectified. The city of Bath instigated an ambitious programme to revive the cult of the waters, first ensuring the sterility of the source, then launching a scheme to build a new spa building for the twenty-first century. NGP won the commission for the entire programme, which also includes the restoration and reopening of the existing spa complex, centred on the distinctive Cross Bath and Hot Bath which have evolved architecturally over centuries. When complete, the new Bath Spa will be the only one of its kind in the UK.

The new spa building takes the place of the only historically and architecturally unremarkable building in the complex – the 1927 Beau Street swimming pool. It is designed to work in concert with the restored Hot Bath of 1775, by the Georgian architect John Wood, which lies alongside. The adjacent Cross Bath is being restored as a facility for the citizens of Bath, along with several other important architectural features of the complex. NGP's restoration work,

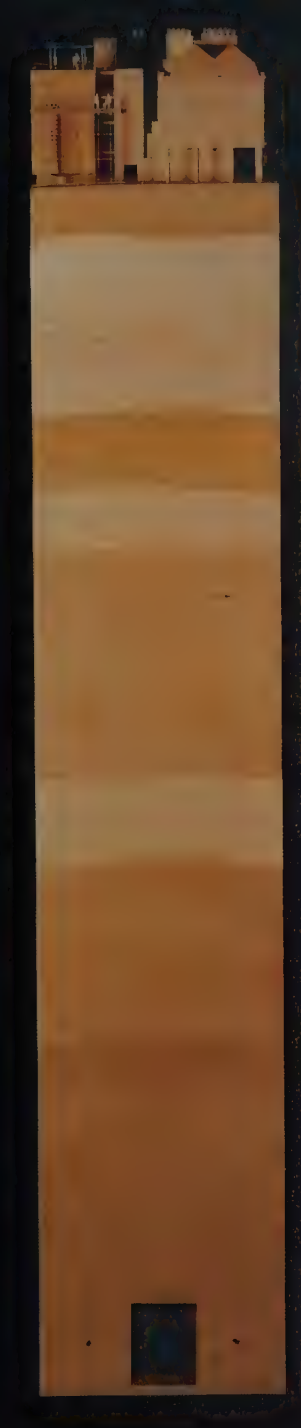


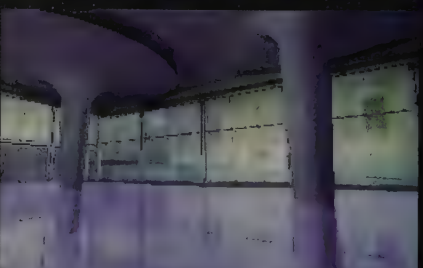
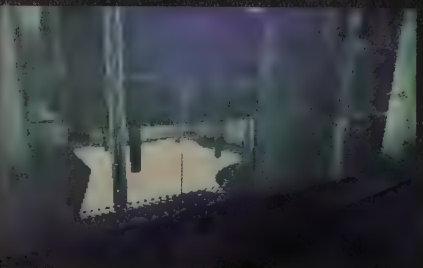
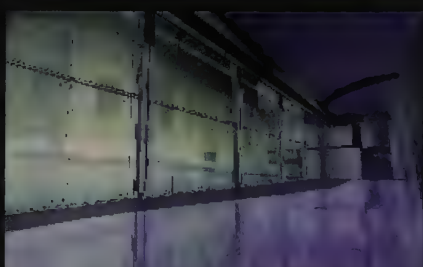
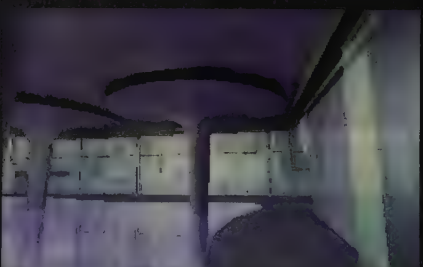
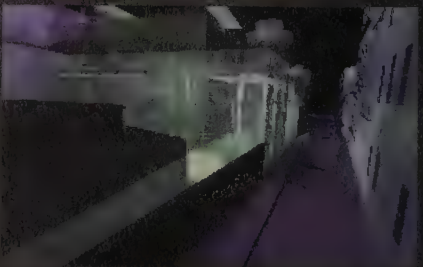
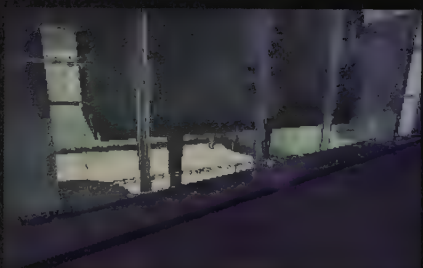
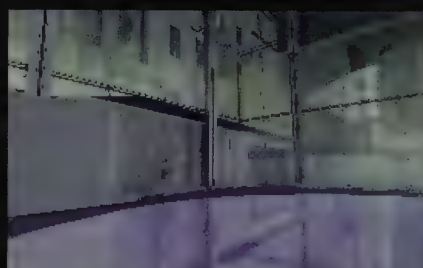
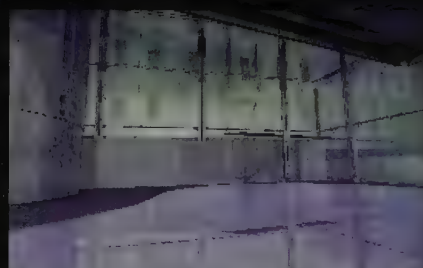
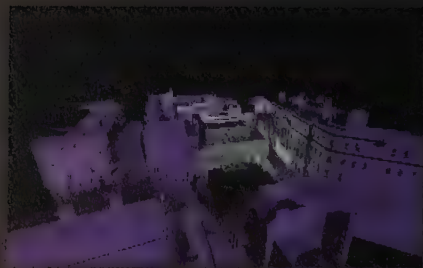
Nick Grimshaw sketches showing site plan and the relationship between levels.

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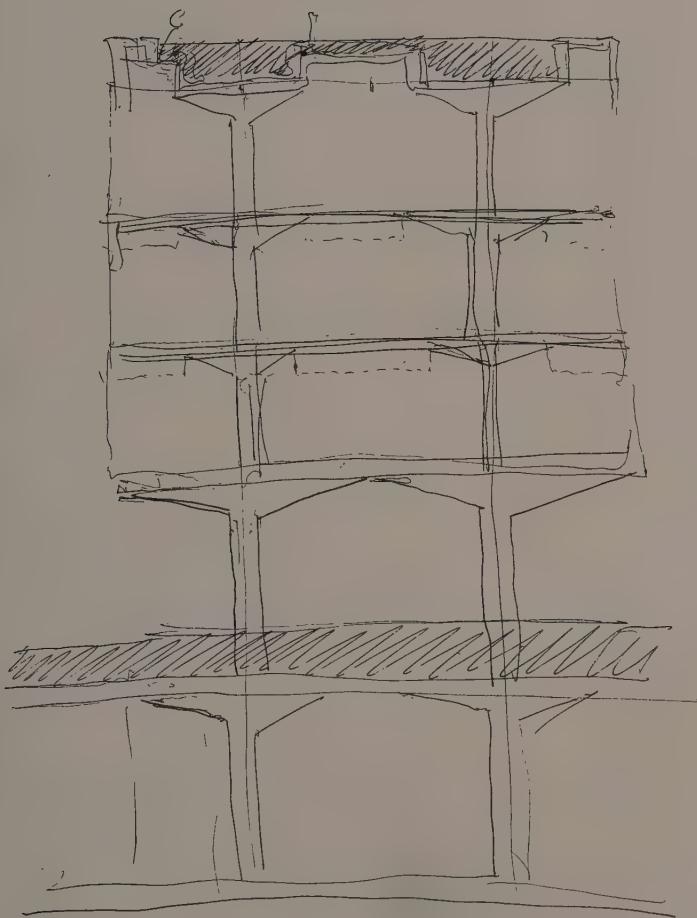


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Four views of an intricate sectional model of the spa which was displayed at the Royal Academy Summer Exhibition, London, 1999.

A series of stills from a 'fly through' computer animation which was developed to present the interior spaces of the building to the client.

Nick Grimshaw sketch section of cube showing the distinctive splayed columns.

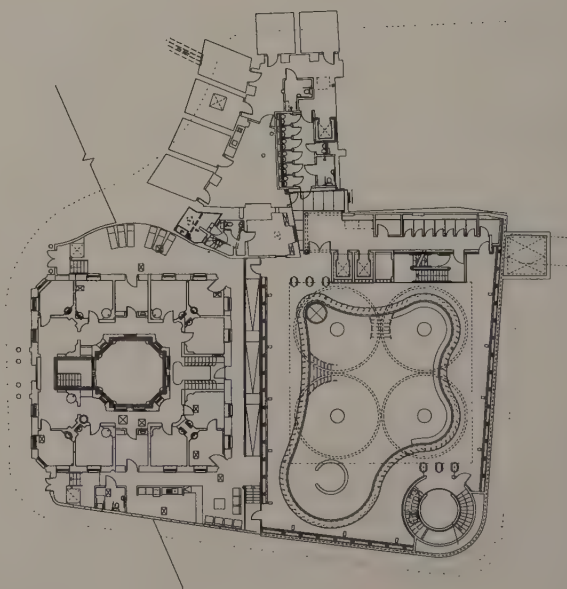
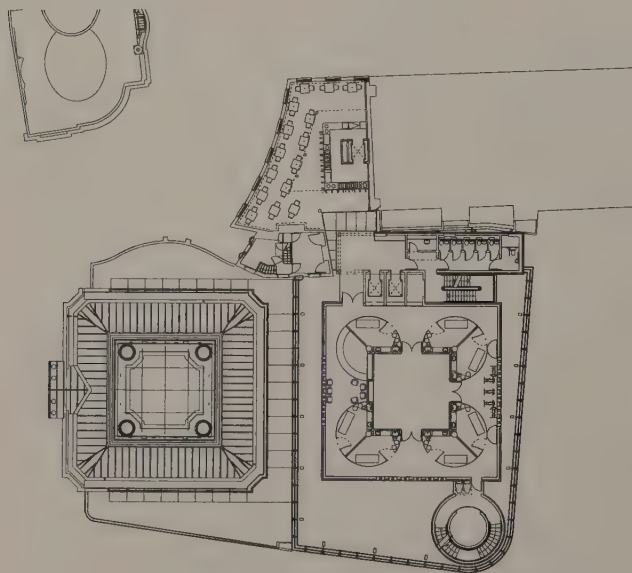
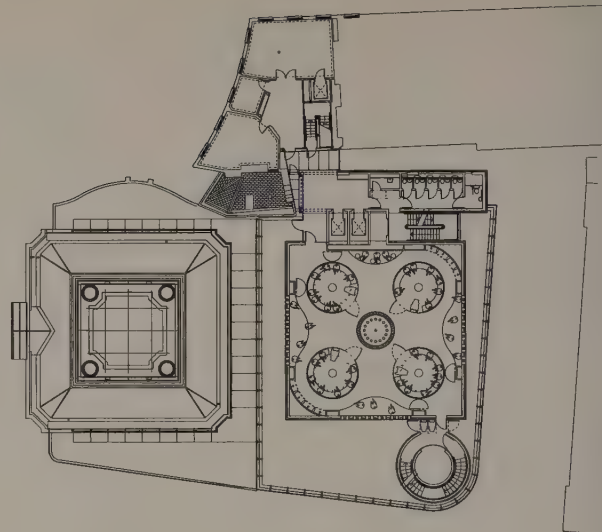
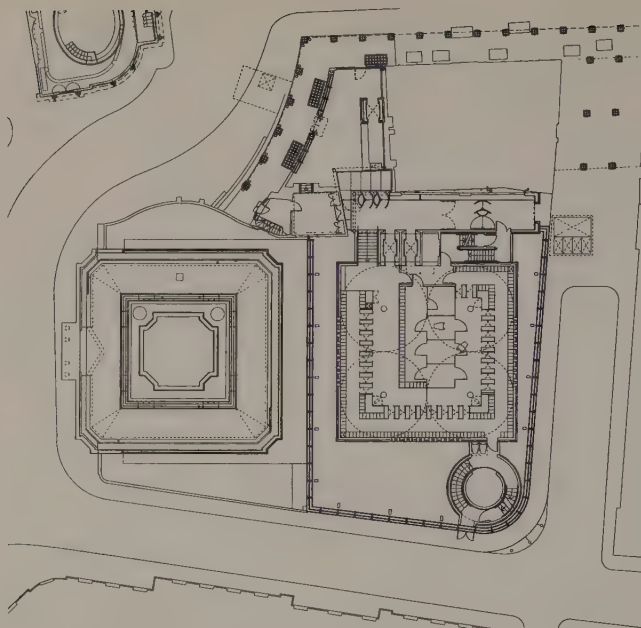


in collaboration with Donald Insall Associates, has proved to be an invigorating process.

The spa building is in the form of a three-storey cube clad in golden Bath Stone and set within a glass enclosure which follows the curve of the street line. A translucent wall solution, lit in soft colours, was adopted. This and other aspects of the commission – including the idea of an external water/steam feature to connect the spa complex with the Roman Baths a short distance away – were developed in collaboration with the artist Vong Phaophanit.

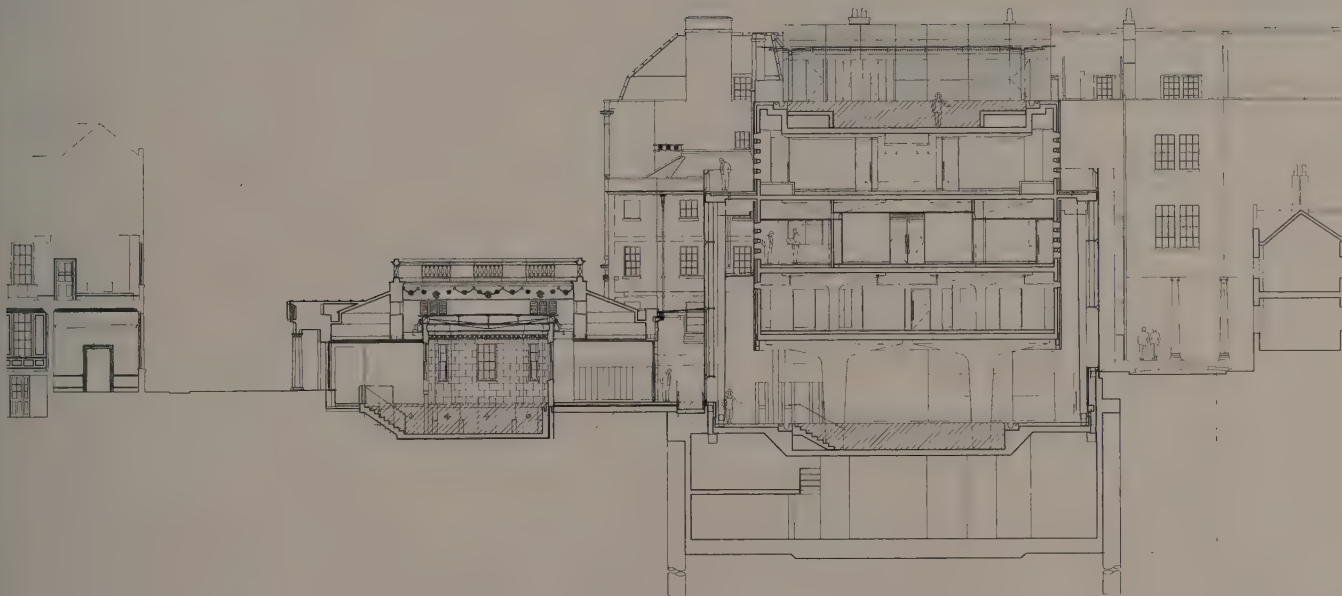
The key feature of the spa building is the way it uses water for bathing on both ground and roof levels. The pools, in contrast to the old strictly geometrical types, are free-form in shape, with the ground-level pool supporting the cube above on pillars. The cube contains changing rooms, steam rooms and a plunge pool. The sequence culminates in the open-air roof-top pool with views across the city and to the surrounding hills.

The Bath Spa project – one of the smaller and more unusual of NGP's crop of Lottery-funded buildings – brings together many strands of the practice's work. In particular it shows NGP, in the very centre of a historic city, developing a project that fuses contemporary architecture with detailed and creative restoration in what is a highly-concentrated architectonic form. It embodies low-energy principles, using the natural heat of the water and the thermal buffer qualities of the local stone, to full effect. At the same time, it takes forward the delight in the handling of water and light first seen in the UK Pavilion for Expo 92 in Seville.



From above, left to right:
upper ground floor plan
(entrance and changing
floor), second floor plan
(steam floor and roof terrace),
first floor plan (gymnasium,
treatment rooms and cafe),
lower ground floor plan (Hot
Bath and main pool).

Section



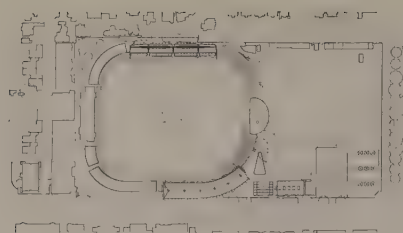


Lord's Grand Stand, London, 1995-98

'The key issue we faced was one of sight lines. It was essential for every seat to have a view of the pitch. A lot of thought went into this and we achieved our goal whilst improving on the capacity of the previous stand by 50 per cent. As a result, the whole stand has only one central column and somehow it seemed right that the roof should hang from this. It hovers over the stand like two great protective wings. To me the stand has an heroic feel. When an important match takes place at Lord's, especially when it ends in a climactic last over, I like the idea that the stand is bearing witness to a great event.'

NG





Previous page
View along roof truss towards
the stand's central mast.

Site plan

A planning model built to
display the new stand in the
context of the existing ground.

The stereotypical view of the Marylebone Cricket Club, the ruling body of England's national sport, is of ultra-conservatism: women, for instance, were only finally admitted to the Club in 1998. This staid image, however, is belied by its adventurous architectural commissioning policy at the historic Lord's Ground in north-west London, the spiritual home of world cricket. Over recent years, the MCC has built a series of new stands and support buildings that are world-class contemporary architecture. One of the largest of these, completed just as the Club liberalized itself in 1998, is the Grand Stand by NGP.

The task was to replace the existing 1926 stand by Sir Herbert Baker – an inefficient place with poor sightlines and circulation and insufficient seating, but nonetheless possessing a distinctive, Italianate character. The MCC's attitude to its Ground acknowledges that a great deal of its charm derives from the *ad hoc* collection of disparate buildings that have evolved over the years – and its rebuilding masterplan over more than a decade stipulated that this should continue. There was no desire to turn Lord's into a homogenous sports stadium. Consequently, architects have the freedom – within the planning constraints of a residential conservation area – to treat each stand as a discrete object.

An additional spur to rebuilding was the fact that, since Government legislation had made Britain's major sports grounds all-seater venues for safety reasons, the overall capacity of Lord's had been reduced. To maximize income and accessibility during the very short peak season, it was necessary to add more seats to restore numbers. Moreover, the



This part-perspex model
clearly shows the structural
elements of the stand.

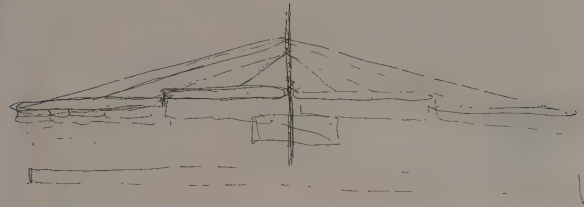






A match in play, summer 1999

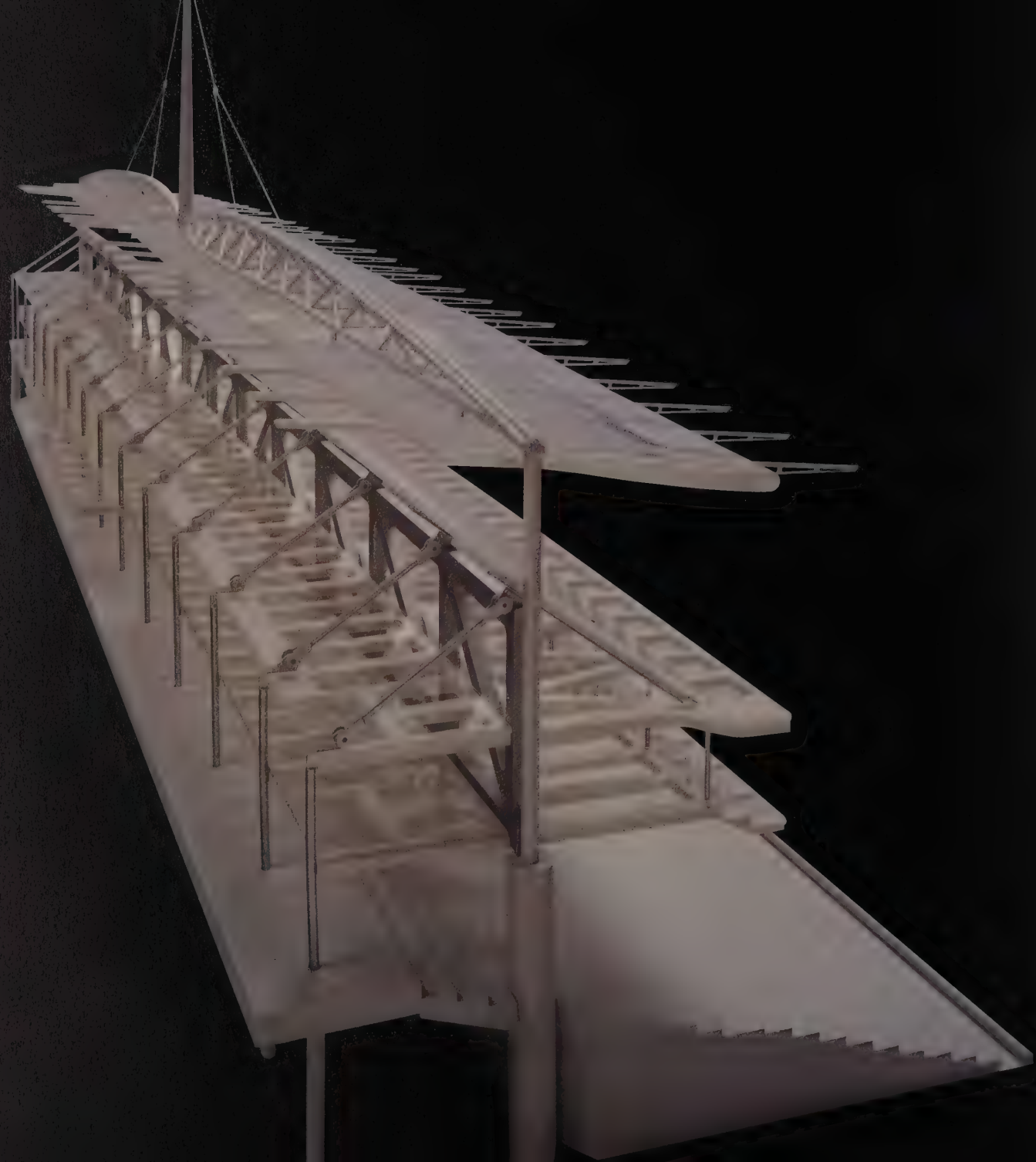
Early sketch by Nick Grimshaw illustrating the aerofoil roof hanging from the mast.



programme for the new Grand Stand was tight, since it had to fit in with phased plans to upgrade Lord's in time for the Cricket World Cup of 1999, and still maximize the capacity during rebuilding.

The commission came in September 1995; work on site began in September 1996 and was completed in June 1998. The lower level of the new stand was in operation for the 1997 season, containing the same number of seats (4,000) as the whole of its demolished predecessor. For 1998, the upper level of debenture seating, boxes, restaurants and suchlike were added. This was a very rapid programme considering that a complete building had to be removed from a restricted site and a £11 million replacement built with 50 per cent more seating capacity, bringing the total to nearly 6,000. As a result, the stand was designed for the maximum amount of off-site prefabrication; everything above the lowest level was made outside, brought in and pieced together like a giant construction kit. Every inch of the site was utilized, and the construction programme was achieved to time and budget by running it like a military exercise. Space was so tight that external staircases overhang a service roadway at the back of the building, while white fabric screens and opaque glass are used to avoid overlooking the gardens of houses right behind. Although the habitable parts of the stand go much higher than the old one, its overall bulk beneath its aerofoil roof is not much greater.

In structural terms, the Grand Stand is not so much a building as a bridge, with the whole structure supported from just three columns – one in the



The two-storey high spine beam which runs the length of the stand in two 50m spans is clearly visible in this view of the model.

Nick Grimshaw sketch section.



centre, rising to a mast, and one at each end. The twin booms of the roof, slung from the mast and tensioned with delicate tie-rods, demonstrate what happens on the central deck, where the expanse of precast raked seating slabs floats in a 50m span either side of the main mast above the lowest tier. A two-storey high spine beam makes all this possible, but that is subsumed into the central level of 25 boxes and back-up restaurants, bars and services, so the 'look-no-hands' illusion is maintained. Balanced on its row of three columns, the entire structure is then held down at the edges like a tent. The tension rods, so slender as to be virtually cables, are effectively invisible to the spectator and scarcely register on film.

The tripartite theme is continued elsewhere: there are three vomitories taking you from ground level up into the lowest seating tier, and three sets of lifts and stairs serving the higher levels. The old Baker Stand also had a tripartite division, with vertical block elements at each end and in the middle, so it could be said that the new one makes an oblique reference to the old. The central mast anchors the composition, while the two largest boxes in the centre can be opened into one big space for special events. The aerofoil roof, with its acoustic underside, acts like the brim of a sunhat, but does so in an appropriately aeronautical manner. Facing almost due south, it has motorized fabric blinds which slide out from the roof edge like wing flaps to shade the upper deck. Should the wind become too strong, they automatically retract, as do the blinds to the boxes.

The mechanical scoreboard built into the centre bay of the old stand has gone: now an electronic



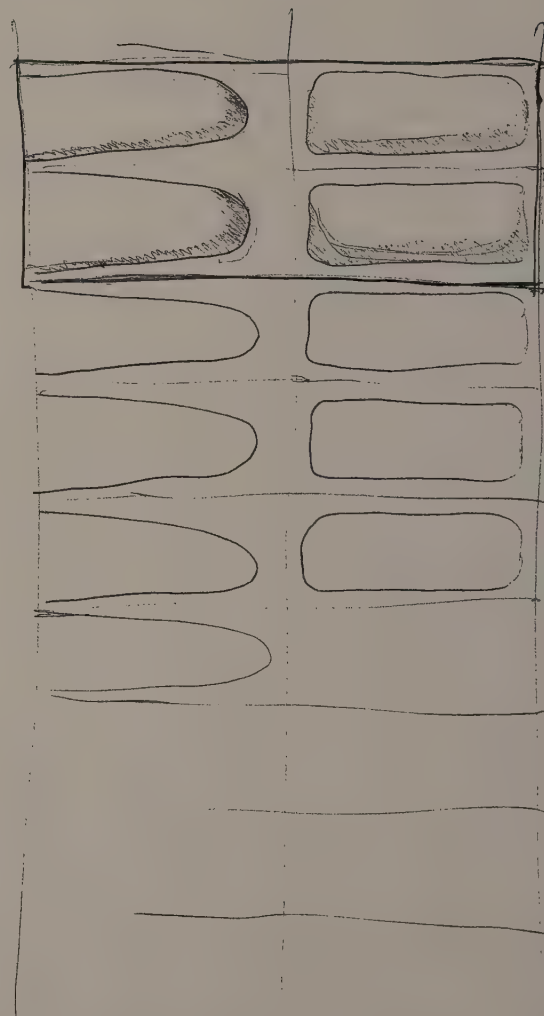
One of the precast slabs ready for inspection at the fabrication plant.

View westwards from the lower terrace.

scoreboard stands adjacent to the new stand. However, the familiar windvane figure of Old Father Time (donated to Lord's by Sir Herbert Baker) has been preserved. At first, it was thought it could be remounted on the new stand, but its relationship with the tall mast would have been unsatisfactory. So it was quietly moved to the clocktower of Sir Michael Hopkins' Mound Stand opposite, and nobody seemed to mind.

The effect of the all-white stand on a summer's day is almost ethereal. Despite its size – it occupies most of one side of the ground – it has a delicacy which renders it a neutral, almost two-dimensional object on television: it does not distract from the coverage of the game one iota. When seen in actuality, its articulated presence is much more powerful, and its studied relationship to the other pieces around the oval ground becomes clear. These are summer pavilions, with something of the temporary encampment about them. For all its permanence as a structure, you could imagine the Grand Stand being packed up and taken away as the season ends and the evenings draw in.

Nick Grimshaw sketch of the underside of several precast slabs.



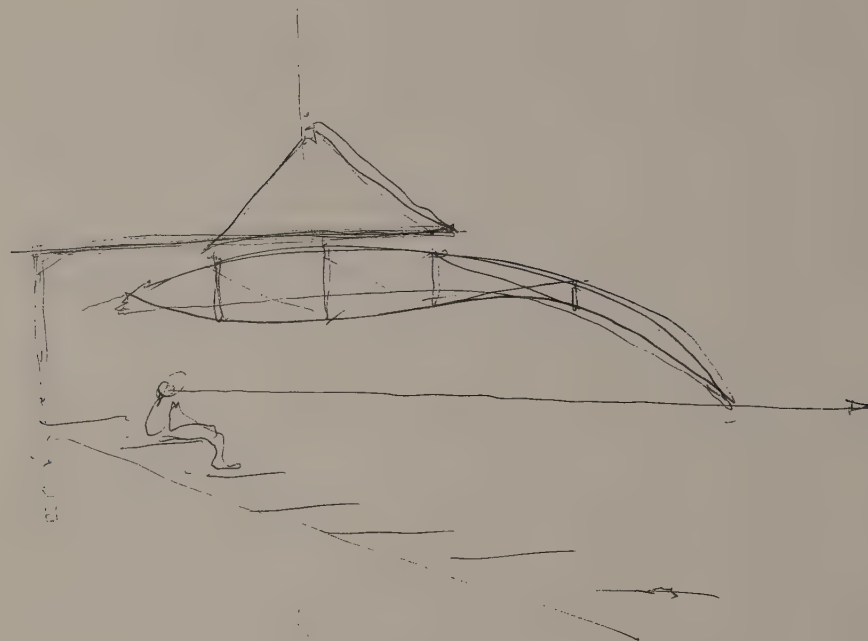


Nick Grimshaw sketch
illustrating the idea behind
the double tie which attaches
the aerofoil roof to the mast.

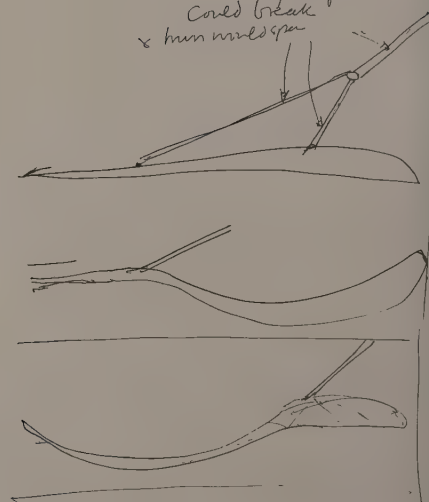
View towards the central mast
from the upper level terrace.

Overleaf

The stand in use on a
match day.



Any one of these
could break
& then would spin



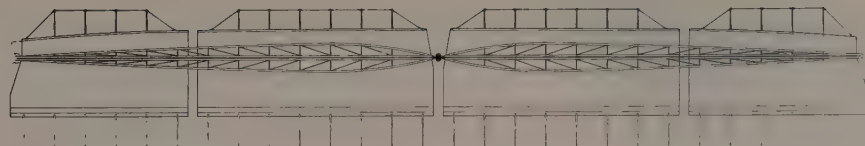




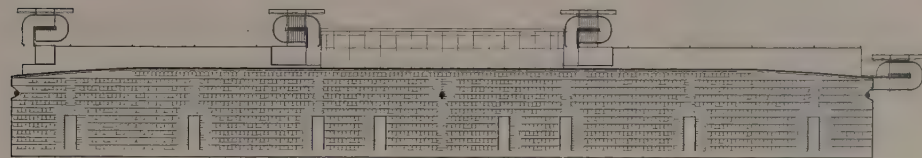




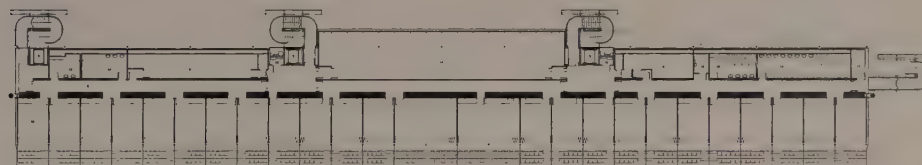
Roof plan



Upper terrace plan

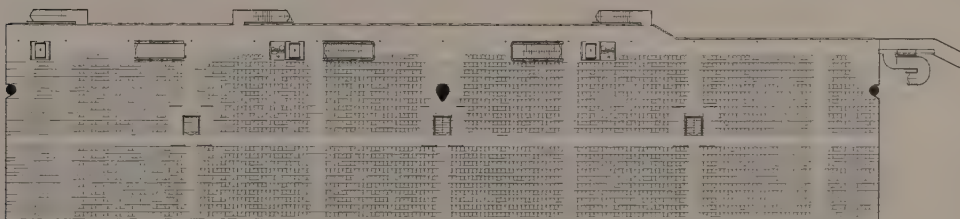


Box-level plan

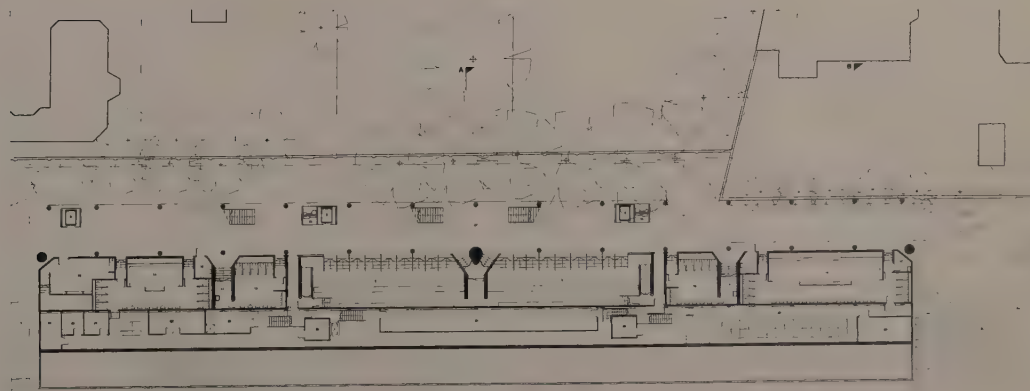


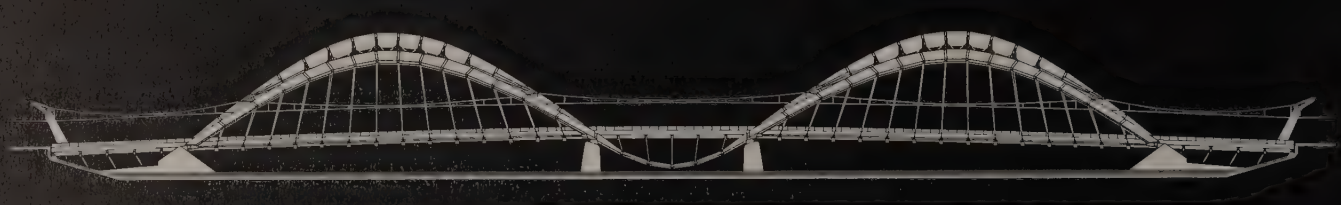
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Lower terrace plan



Ground-level plan





IJburg Bridges, Amsterdam, 1997–2000

The idea of building a bridge as part of a land reclamation process intrigued us. The competition-winning bridge spans between the mainland and the perimeter piling of an area in the IJmeer lake to be reclaimed. The bridge will be used initially by lorries transporting solid material to fill the piled area.

The concept was a long snaking form with maximum spans to minimize the number of foundations. Having created one bridge, the hope is that more will follow as further islands are added like beads on a necklace. **NG**





Previous page
Detail view of model.



Elevation and plan views
of model.

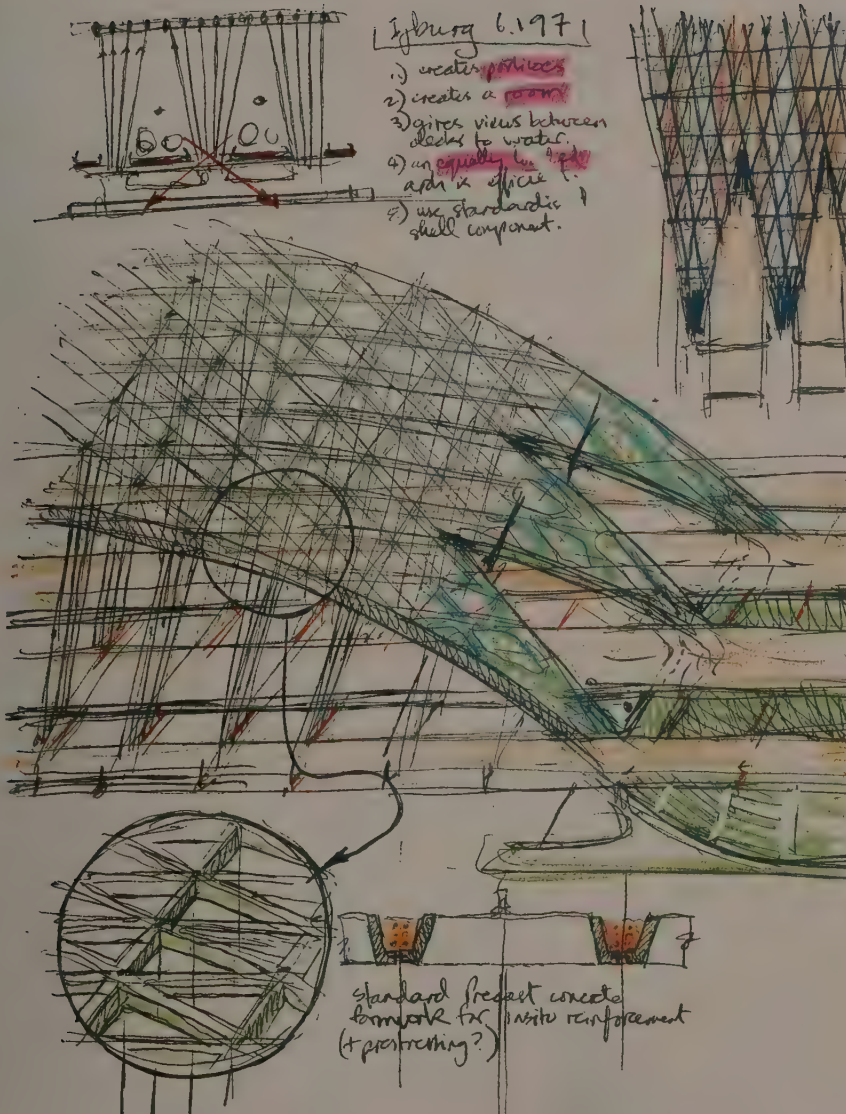
Computer-rendered sectional
perspective showing the
wider deck of the second
bridge.



Only in The Netherlands, perhaps, would anyone consider it normal to build the bridge first and make the land second. But the IJburg Bridge – a project won in international competition – was seen by the City of Amsterdam as a gateway to a new, man-made, urban archipelago now being built in the IJmeer, an inlet from the huge, enclosed freshwater lake of the Zuiderzee. The high-density settlements will relieve pressure on the city while being close enough to use its existing facilities without adding to traffic congestion.

Politically, as well as physically, IJburg was an important step for the country to take: a referendum was held to gauge public support for this ambitious project. The fact that it is to take the form of seven linked islands – so maintaining the identity of the lake despite its proximity to the city – is a break with the twentieth-century tradition of creating vast polders contiguous with the mainland. Moreover, each of the islands is to be given a distinct character and name. Work started in late 1998; by 2010, 18,000 new homes and many other buildings will have been built on 450 hectares of new land, along with a complete urban infrastructure including road and rail networks.

Around this area sky, land and water meet in an extraordinary, at times hypnotic, synthesis. Vertical elements mostly take the prosaic form of electricity pylons. The need to create a landmark was clear; at the same time the NGP architects felt it was important for the bridge to be a real bridge, not a causeway. A suspension structure, with its necessary vertical towers, would have merged visually with the



pylons from some viewpoints. However, a design evolved which – though prominent – worked with the horizontality of the topography rather than being in clear opposition to it.

A family of bridges has been developed: the main, 250m-long approach bridge and then a further, 60m-long one linking to the second island, with others envisaged in the same idiom as the development of the new islands proceeds. The leap from old land to new, at whatever point, will be marked by a double arch. Links between islands will be a single arch.

The design concept for the main bridge is visually simple but structurally ambitious: to link a two-arched form by means of a counter-arch between the two, thus creating the effect of a sinusoidal wave. In the competition scheme, a larger and smaller arch were proposed, with the water-skimming counter-arch resting on a central abutment. The design developed into a symmetrical arrangement of two equal-sized arches, with a pair of central abutments to take the load. The effect of an undulating water-snake – with head and tail provided by angled information and lighting gantries – is helped by the fact that the Umeer is non-tidal, and so there is little vertical movement of the surface to expose the engineering underpinnings.

Structurally, two actions occur. The main arches work conventionally enough, but the linking counter-arch beneath the road deck, while visually continuous with the main arches, functions as a bowspring truss. It is in compression, but reads visually as if it is hanging in tension, merely touching the water.

The bridge is 35m wide, requiring a triple arrangement of arches instead of the more usual pair.



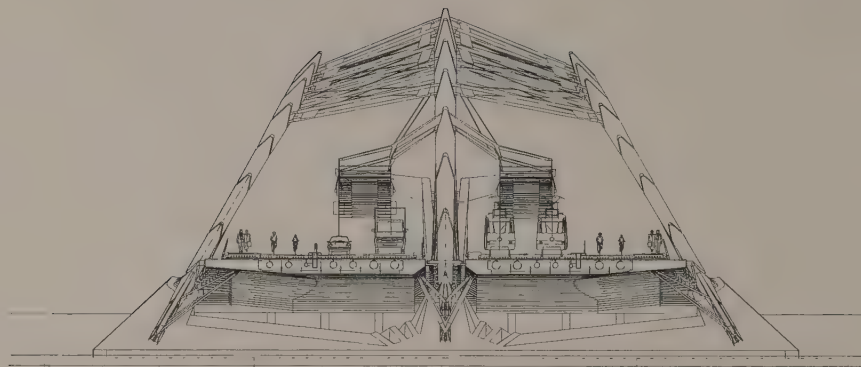


Computer-rendered view of competition scheme.

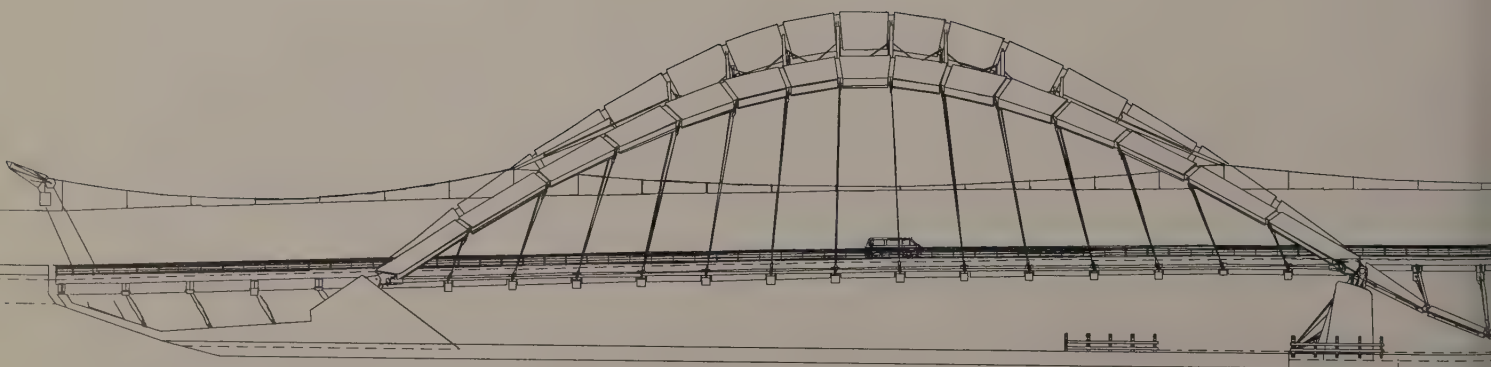
There are two lanes for motor vehicles, and two each for trains, cycles and pedestrians. This width and segregation of traffic types would, on a conventional broad deck, remove much of the visual sense of crossing water, particularly for those close to the middle. Accordingly, the deck is split longitudinally and the resulting slot defined by means of the central arch structure. The arches incline together at the top and splay out a little at the base. Crossing the bridge, with this sense of partial enclosure, is like passing through two extraordinary rooms.

The two main arch clusters are of box-girder construction – rather like the hoops of Ludwig Erhard Haus in Berlin – but here deliberately faceted rather than smoothed. The intention is to create a structure that is bony in appearance, as if it were the skeleton of some great marine creature. It thus takes its place in the line of buildings, starting with the Waterloo International Rail Terminal in London, where the design is inspired at least in part by organic forms. Here the metaphor is multivalent, drawing in not only the immediately obvious imagery of whale-like ribcages, but also the jointed, articulated limbs of exoskeletal creatures such as crabs and lobsters. It serves as a reminder that the waters of the IJmeer, although fresh today, used to be a heavily-fished part of the sea.

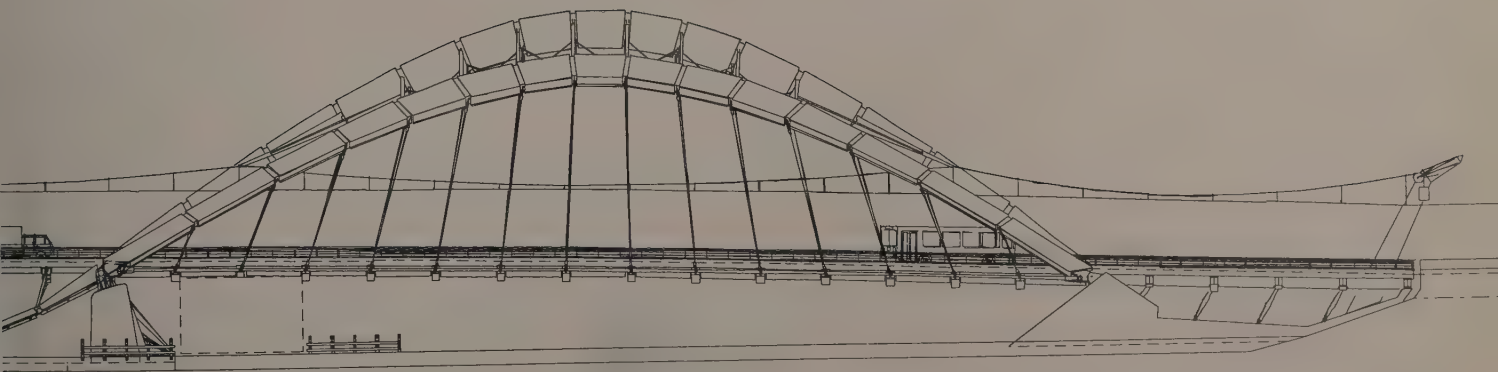
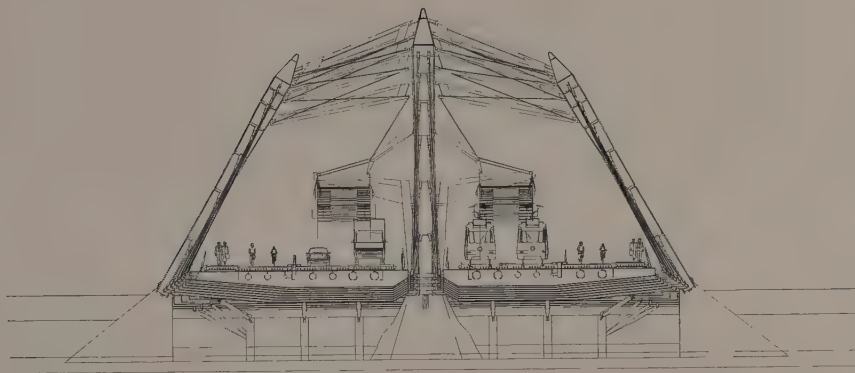
The bridges are the first stage in the making of the islands, being built in open water to provide the necessary access for the spoil trucks. This was the first Dutch commission for NGP, but it was followed soon after by another, for a station next to the Ajax football stadium, not far away.



Sections through bridge deck
of Bridge 2001.



Elevation of Bridge 2001.





Orange Call Centre, Darlington, 1995-98

We created a very simple 7.2m-high industrial shell, a type of structure with which we have had long experience. We then set out to customize the shell and make a good environment for office use.

Many people feel that this lofty space is a nicer place in which to work than the low-ceilinged office blocks they have experienced. The uplighting is very restful and the sculptural form of the reflectors are popular. The restaurant space is also much liked by the users of the building. The result is a genuinely flexible, multi-purpose building which could be used for warehousing, industry, leisure or offices. Hopefully it will therefore have a long and useful life.

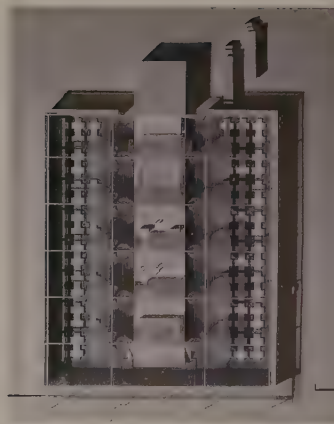
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Detail of the light reflectors.

Plan view of model showing a possible configuration of workstations.

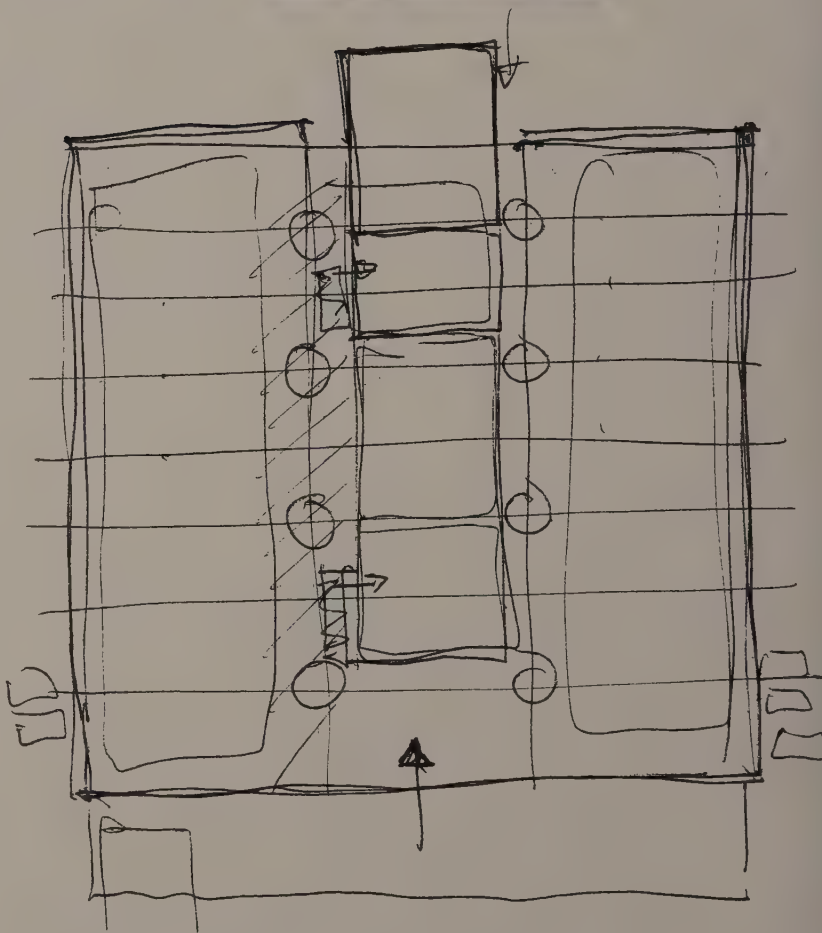
Chris Nash sketch plan.

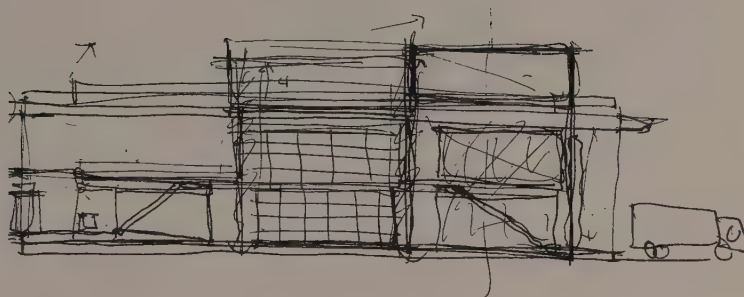


With this project, NGP enthusiastically returned to an enduring strand in the practice's work: the serviced shed. The difference this time was that, whereas earlier work in this field had been for distribution warehouses, sports halls and factories, the Orange Call Centre was conceived as a hybrid. It was to be built as a computer-reliant, densely populated communications centre, yet it had to be capable of reverting with ease to something much less complex: a simple, relatively depopulated industrial building.

Orange was, at the time of the commission, one of the smaller but technically most advanced of the UK's four mobile phone networks, backed by the might of the Hong Kong-based Hutchison Telecom. Orange was a very design-aware brand, aggressively marketed as a lifestyle necessity on the basis of both its technology and its customer support. As a fast-expanding company acquiring market share in what was proving to be a gold-rush industry, Orange needed to expand its staff constantly so as to keep its telephone hotline service abreast of demand. Central to the smooth functioning of such an organization is the 'call centre', one of the most important (and least studied) new building types of the 1990s.

Call centres in the UK are traditionally located in those post-industrial areas where there is a large available workforce with, what is deemed to be, the right (that is, comprehensible and reassuring) regional accent. The north-east of England is such a place, and Hutchison already possessed a site with a number of *ad hoc* buildings in a business/industrial





Chris Nash sketch section.

View of east elevation.









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Glazed south elevation
showing internal louvres.

Detail view of the corrugated
cladding panels and linear
windows.

park on the edge of Darlington. The change in the nature of employment locally is graphically demonstrated by the fact that an iconic British post-war industrial building stands empty virtually opposite the Hutchison site: the Miesian temple of the 1960 Cummins Engineering factory by Kevin Roche, John Dinkeloo and Associates survives, but the jobs have gone.

The first project designed by NGP for Orange was very different to what finally got built, which had a lot to do with the changing nature of the client company. Initial plans were for a more lavish building – a further development of the atrium-based series begun by the Western Morning News building and continued with the RAC Regional Headquarters at Bradley Stoke, itself a type of call centre. It would have acted as a central services building for the Hutchison campus, linking existing buildings and providing a number of staff facilities beyond the call centre and marketing function.

The scheme, along with another for an Orange headquarters building in Slough, was shelved when Hutchison decided to float Orange on the stock market, which happened in 1996. In such circumstances, companies have to be seen by analysts to be containing costs. But the need for a large new call centre was pressing. Consequently, the Darlington commission was re-evaluated. The 'campus centre' idea was dropped in favour of a discrete new building to house the call centre and marketing operations for Orange, together with just one of the campus-wide facilities originally envisaged – a restaurant to serve all the Hutchison

South elevation with
the oversailing external
sun-shading louvres.



Orange Call Centre



View from entrance to mezzanine level, with an example of the pared-down detailing at the junction of the column and beam beneath the skylight.

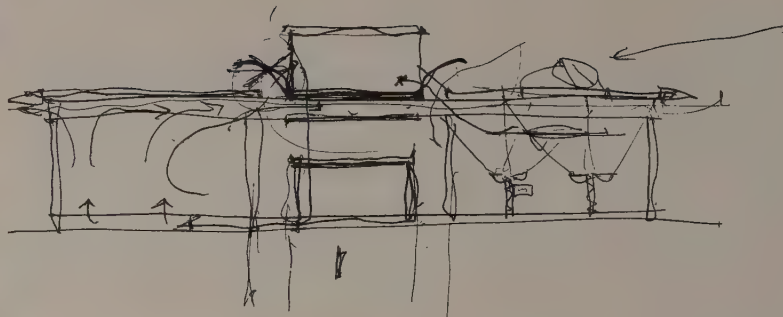
View across entrance with the 'bulk head' of the mezzanine-level coffee bar on the right.



employees on the site. Moreover, the building had to be low cost and capable of being readily sold on to future, non-telecom users – which here meant manufacturing and warehousing companies.

Orange had effectively reduced the budget per square metre by a third, so bringing it down to what was little more than the price of a standard warehouse/industrial shed. And – given that doing interesting things with industrial sheds is a genetic predisposition of the practice – that is what got built. Industrial sheds have a lot going for them: they are a cheap way to enclose space; they are tall, since they are intended for high palletized storage; they have strong floor slabs, allowing you to vary the internal usage at will; they are lightweight, largely prefabricated and rapidly built; they have wide spans, so giving you considerable freedom in space-planning. The trick is to refine the structure, tweak the envelope and make use of the volume by introducing unexpected elements. All of these techniques are deployed at Orange.

The new Call Centre stands out in the herd of otherwise humdrum buildings. The entire 60m, south-facing frontage is glazed beneath its oversailing, sun-shading louvres, allowing perspective views into the huge internal space: a clerestory of glazing makes the roof appear to float. On a dull day, or at night-time, the intriguing illuminated forms of the giant, curved, fabric light reflectors inside act as beacons; the supergraphic 'Orange', screened onto the glass after installation, is surprisingly recessive for its size compared with these reflectors, dubbed 'Pringles' after the potato



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crisps of similar double-curved shape. Indeed, the whole effect is to reveal the workings of the interior. In this it compares with an earlier sophisticated 'shed' – the Financial Times Printing Works building in East London of 1987–88, where an entire industrial process was revealed.

The structure is as lean as it could be – 'third-generation portal framing', as the project architect Simon Beames describes it. The frame was developed with Andrew Woodward, of structural engineers WSP, to be very skinny – thus saving weight, so releasing more of the limited budget to spend on internal detailing. The saving of weight and the saving of money became the project's Holy Grail, and affected every aspect of it. Thus (to give a prosaic example) the main roof beams were pre-cambered with a slight rise towards the centre. Although this was done primarily for visual reasons – to avoid the impression of sagging that a truly flat beam can give – the outcome was to avoid the need to build up roof insulation so as to create a run-off slope for rainwater. Result: money saved in roof insulation.

The money thus diverted went into such details as the cruciform column heads inside, which (in a piece of architectural sleight-of-hand) do not bear onto the roof at all, instead nuzzling up to the inflated ETFE pillows of the ten 6m circular rooflights. The columns do, however, support the latticework of roof beams, so this detail acknowledges the structural integrity of the frame while simultaneously making the rooflights into ghostly mushroom column heads themselves.



Above left: view across mezzanine restaurant showing the integrated system of natural and artificial lighting.

Above: Chris Nash sketch section illustrating the lighting and ventilation principles.

Left: one of the ground floor meeting areas in use.

View of workstations from mezzanine level.

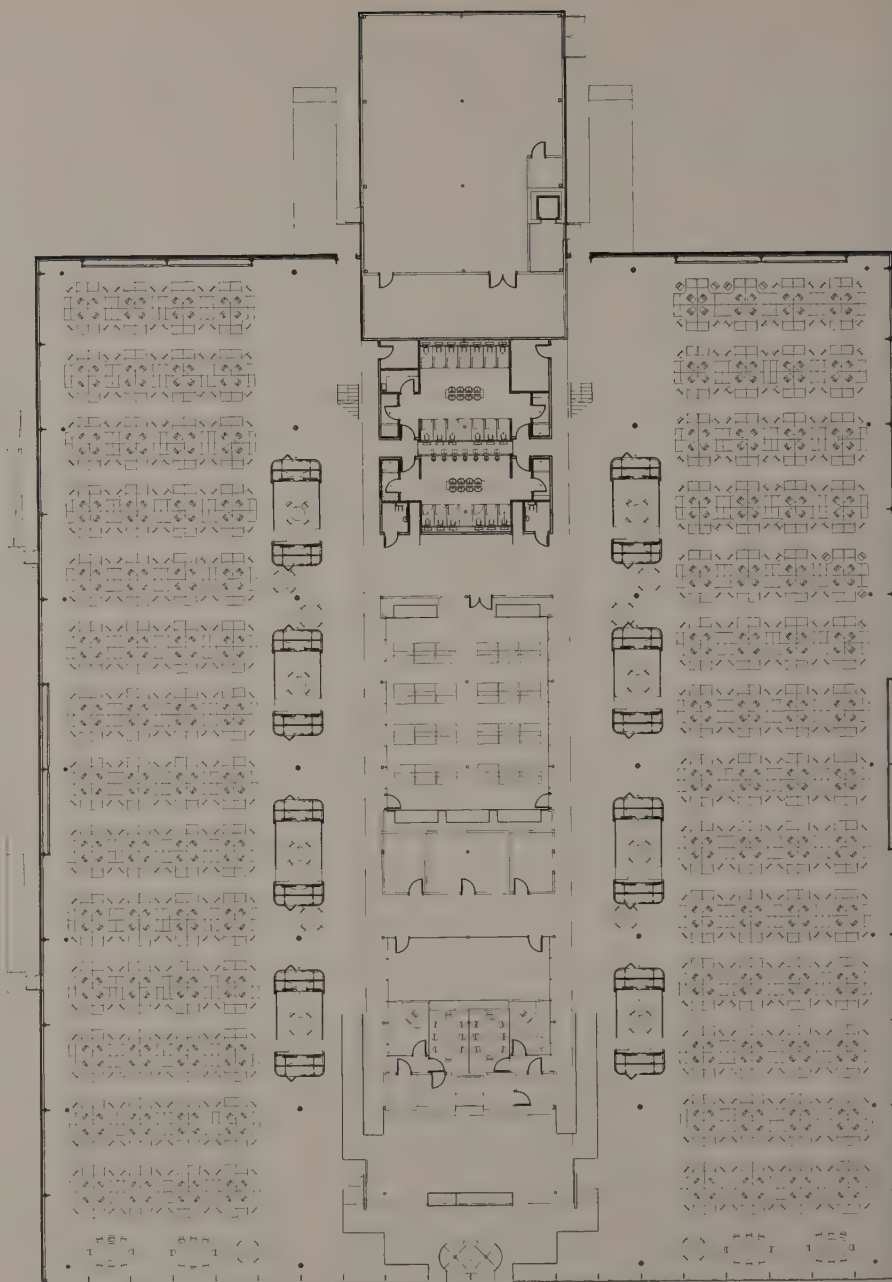


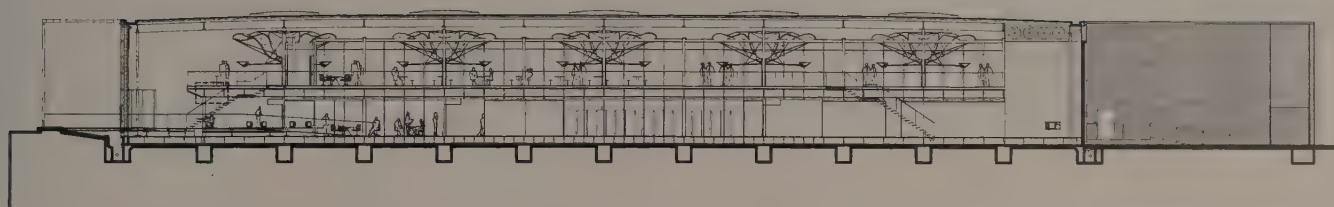
They are like a negative version of those at Frank Lloyd Wright's Johnson Wax building (where the solid mushrooms overlay a translucent ceiling).

The organization of the interior is symmetrical and logical. A steel-framed mezzanine structure with maple-veneered soffit forms a central spine with the glass-walled restaurant and café on top, and meeting rooms, computer rooms and washrooms beneath. Either side of this spine are workstations – the call centre functions on one side, marketing operations the other. On each side, freestanding glass-walled office 'pods' for senior managers are arranged in a line, each pod providing storage in its maple-finished, rounded ends.

Much of the character of the interior stems from the purpose-designed lighting system. The glass fibre fabric reflectors – which also act as acoustic baffles – are rigged on the primary columns beneath the skylights with floodlights shining up at them. Adjustable by means of tension cables, these fragile, petal-like forms produce glare-free illumination and are curiously soothing – and accord well with the feng shui principles with which the building, as with all Hutchison buildings, complies (a feng shui master advised on certain aspects and eventually approved the finished building).

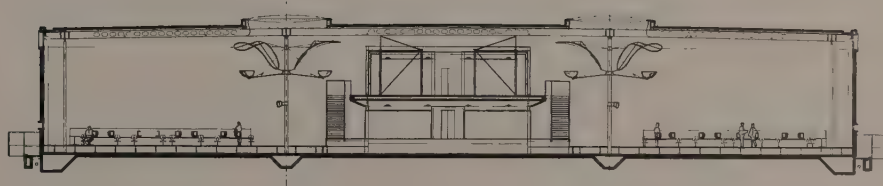
Built for a cost of just £1,259 per square metre fully fitted out, the Orange Call Centre is an example of a building type that too often is built without real architectural input at all. Its clear architectural integrity, compared with many other buildings of this type, reveals it to be a mature example of a design approach refined over thirty years.

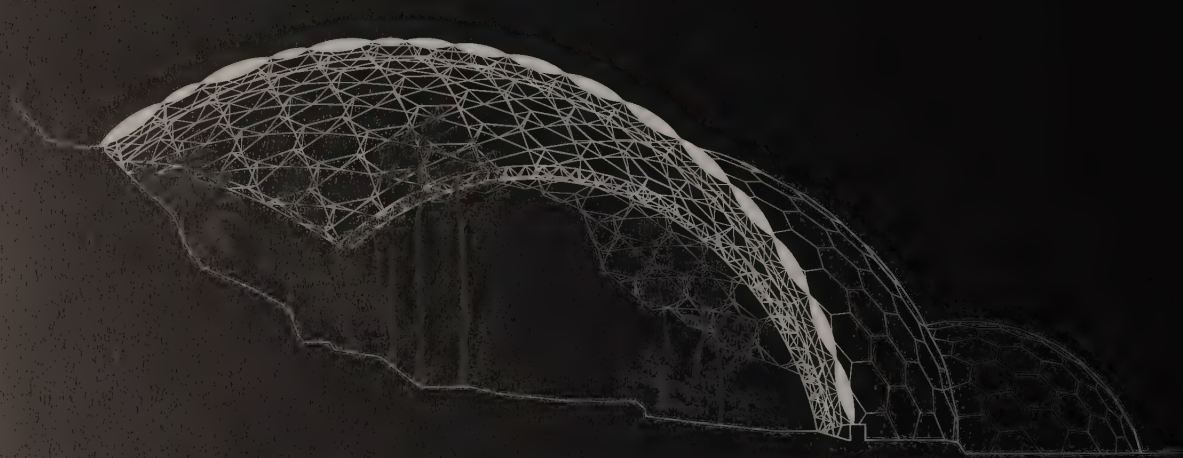




North-south section.

East-west section.





The Eden Project, Cornwall, 1996–2001

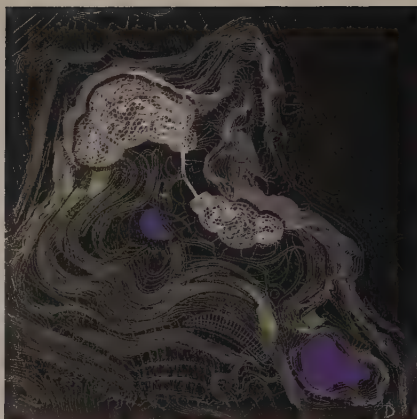
This project has held the office in thrall since the moment we got it. The brief was to build the largest plant enclosure in the world, but also to do this in the lightest and most ecological way possible. In the end a geodesic structure seemed the obvious choice given the irregular terrain of the abandoned clay pits and the varying spans needed to cover it. A by-product of this geodesic structure has been the evolution of distinctive organic forms.

Coming to the edge of the pit for the first time, I really felt I was discovering a lost world, an idea reinforced by the wonderful organic structure set in its hectares of landscaping.

I think this is a project we will all return to time and again. Not just to see the structure, but to see the growth and change in this botanical kingdom.

NG





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Computer-rendered view from inside the inflated ETFE cushions.

Site plan.

View of the clay pit site during construction.

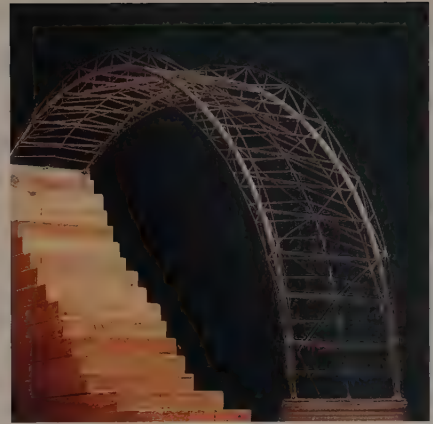
One of the largest of the UK's 'landmark' Millennium schemes to be approved, the Eden Project is the result of the strong vision and strenuous efforts of its originators, the horticultural expert Tim Smit and his commissioning architect, Jonathan Ball. NGP and engineers Anthony Hunt Associates were approached at the start of the process and became partners in the design development of the scheme.

It was at first entirely at-risk, since the Millennium Commission did not fund feasibility projects and, moreover, insisted on matching private funding of at least 50 per cent of the capital cost of all schemes it financed. A sound business plan also had to be approved to demonstrate that the project would be able to meet its own running costs once built – the Commission did not offer endowments for the operation of its flagship buildings. Given all this, it is quite remarkable that the Eden Project, built in a worked-out clay pit near St Austell in Cornwall, managed to come into being at all.

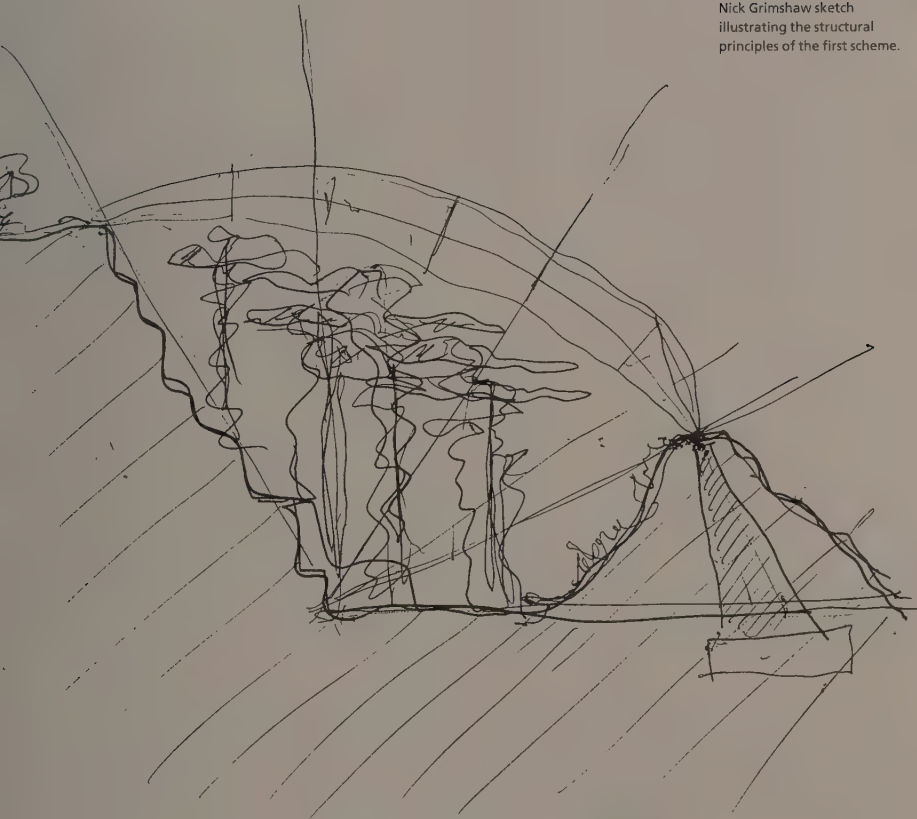
However, everyone stuck with it through successive design changes imposed both by financial constraints and by the extraordinary physical nature of the site. They did so for two reasons: because of the compelling 'botanical ark' nature of the project, with its intention to encourage biodiversity by creating real climate-zone 'biomes' from desert to rainforest; and because of the spectacular visitor attraction that the site and its architecture presented. The aim was to produce a centre which both explains man's dependence upon the plant world and which, through its research and conservation programmes, actively helps develop that relationship.



One of a pair of working models built to investigate structural systems at the early stages of the project.



Nick Grimshaw sketch illustrating the structural principles of the first scheme.



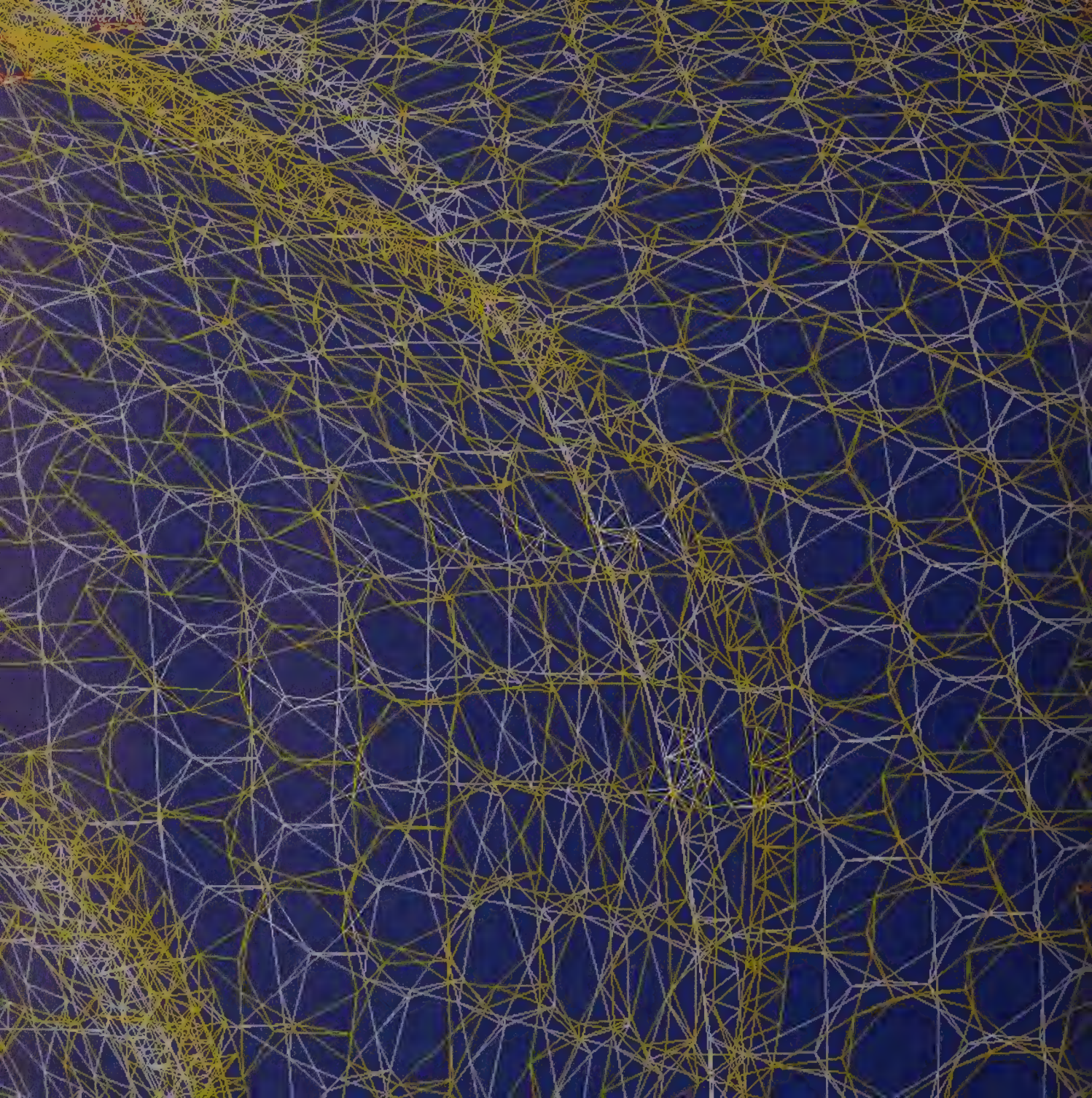
What was envisaged was a sequence of great glazed spaces that would each contain a self-supporting climate zone, threaded round the craggy contours of the deep quarry. Although used for years to extract a large pocket of china clay, the geological quirks of this part of the UK mean that the sides of the pit are solid rock, while the excavated floor lends itself to landscaping and water features. NGP and Anthony Hunt were first approached because it seemed to the promoters that the asymmetrical, organic form of the roof of the Waterloo International Terminal could in some way be adapted to the Cornish site

At first, this idea was pursued, and the biomes of the Eden Project were designed as a new type of Grimshaw varying-arch structure following that at Waterloo. This prototype scheme was enough to secure the finance from the Millennium Commission, but when detailed design began it soon became apparent that arched structures would demand a great deal of expensive rock blasting to even out the site sufficiently. The structure switched to a simpler system that would sit more lightly on the site: a sequence of interlinked geodesic domes, covering 2.2 hectares. The Buckminster Fuller geodesic principle allows enormous variation at the edges, and also provides a neat 9-m hexagonal module for glazing purposes – in this case, cushions of inflated ETFE transparent foil.

Thus the evolved system provided the best response to the site conditions – structure responding to site, rather than vice versa – and had the added merit of being very light indeed. Its principal components of straight, tubular, compressive members connected by





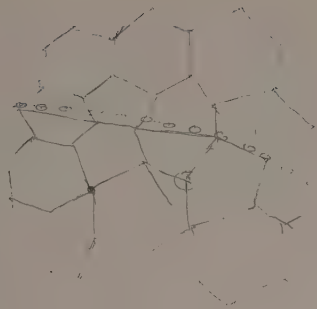


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Computer-rendering made to objectify and explain the biomes to the client.

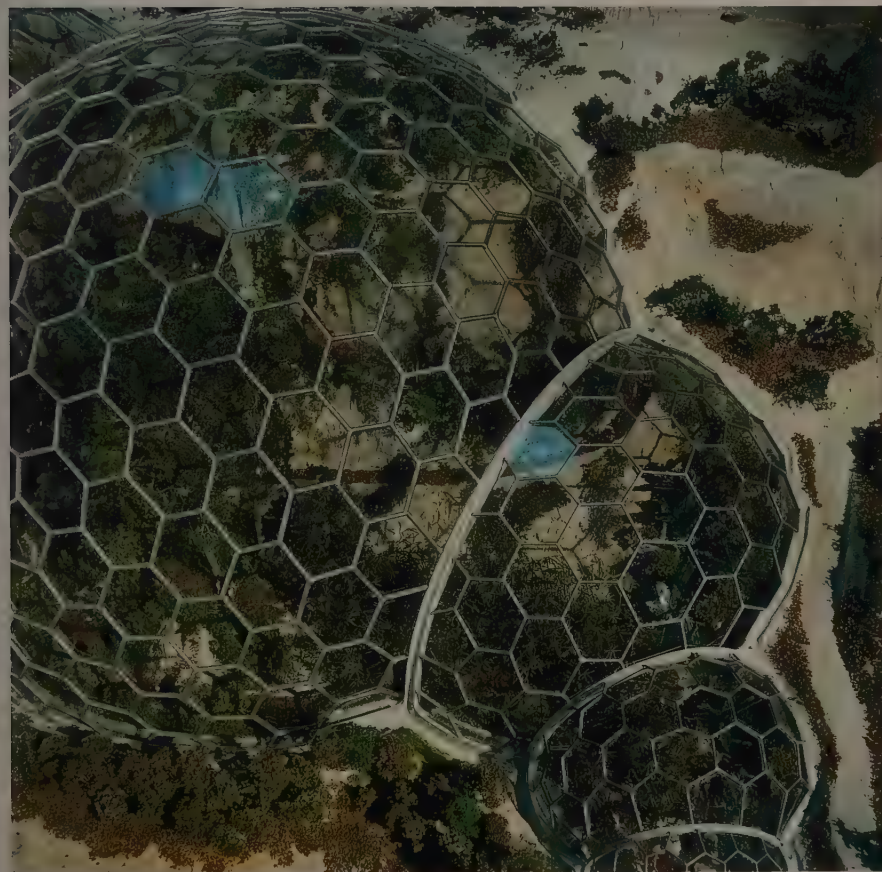
Left: detail view of a computer-rendered structural frame showing the intersection of two biomes.

Right: Nick Grimshaw sketch which explores a detail at this junction.



Right: a small-scale working model which was welded together when the design evolved into a geodesic structure.

Below: 'life-like' model built to give an impression of the finished scheme with planting.



standard cast connectors are relatively small and easily transportable, while the ETFE skin represents less than 1 per cent of the dead weight of equivalent glass and a fraction of the embodied energy. Given the location of the site in the extreme south-west of England, well away from the main manufacturing areas, these considerations were important in reducing cost and increasing erection speed.

By the time construction commenced in early 1999, Eden had resolved itself into two main clusters of interlinked domes – one a 'warm temperate' biome and the other a 'humid tropical' one where a complete rainforest will grow. Each biome consists of four conjoined sections (in some cases virtually fragments) of the geodesic spheres known as 'Buckyballs' after their inventor. The biomes are set against, and wrap round, the quarry walls in a broad S-shape. At their biggest, the domes can accommodate tall rainforest trees and waterfalls cascading down the quarry sides. High-level walkways will allow visitors to wander through the forest canopy – though in the early years, the rapid growth of the forest canopy will be the main attraction; bamboo is expected to grow at 35mm per day.

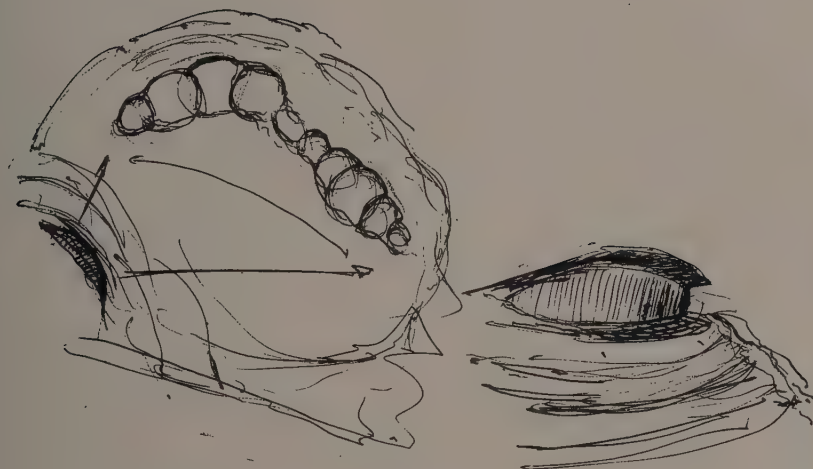
The two domes are linked by a different building type taking the form of an extruded, flattened arch. This central structure contains services, restaurant and an exhibition space and its earth-sheltered roof construction extends landscaping over the building. Because the Eden Project is located in a 15-hectare hole below the level of the surrounding land, a separate visitor centre on top, using earth construction techniques, acts as an induction point for



Left: fabric roof canopies to the visitors' centre courtyard.

Below: Andrew Whalley sketches explaining the relationships between the visitors' centre and biomes.

Right, top to bottom: the visitors' centre under construction, seen from the courtyard; rammed earth wall under construction; courtyard entrance to the visitors' centre.





An ETFE pillow undergoing testing in Germany.

Right and below: the biomes under construction.

Overleaf site plan showing the relationship of the biomes and visitors' centre to the contours of the landscape.

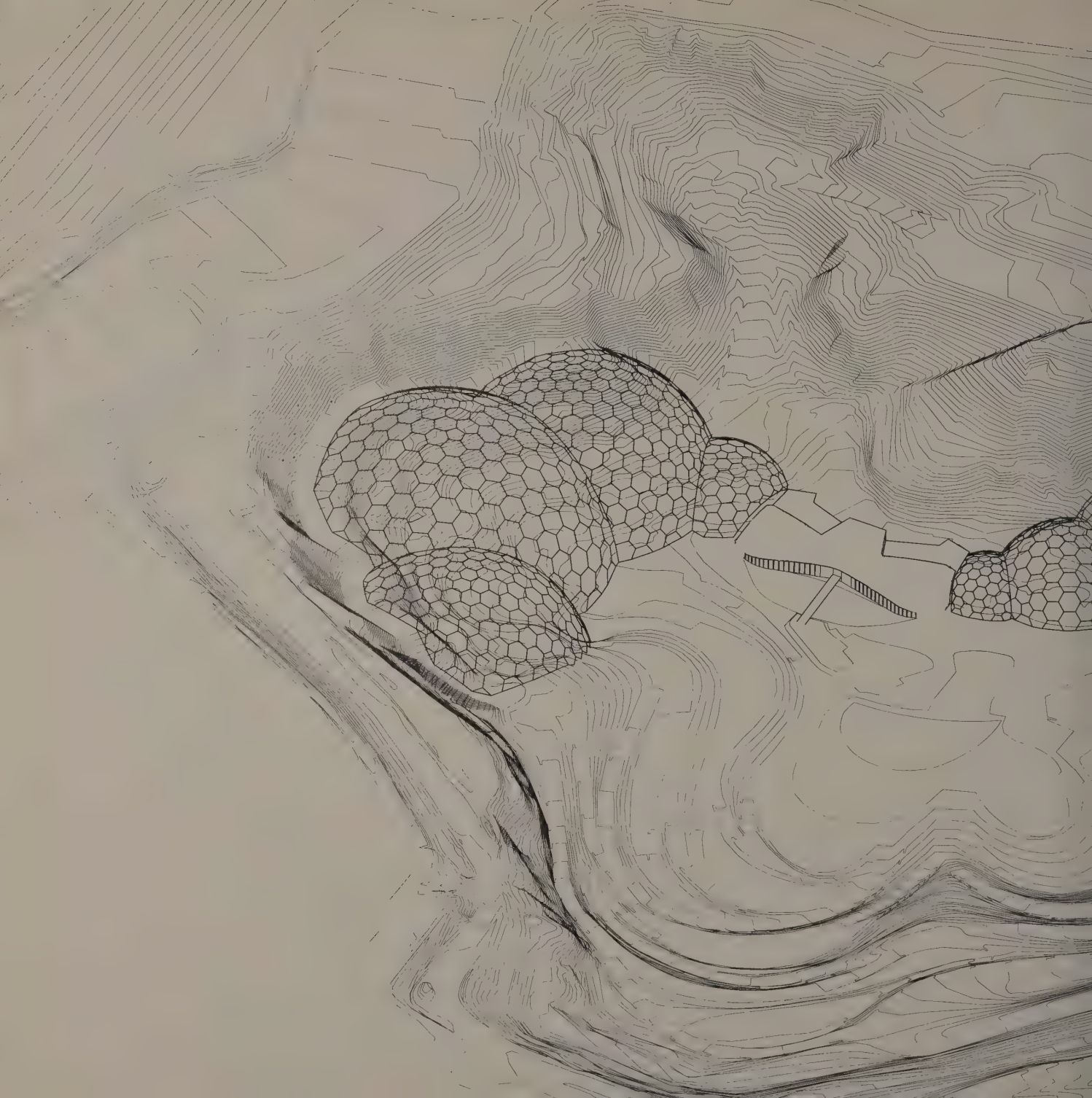
visitors. Many of the project's non-public research facilities are also located on top and will develop the project.

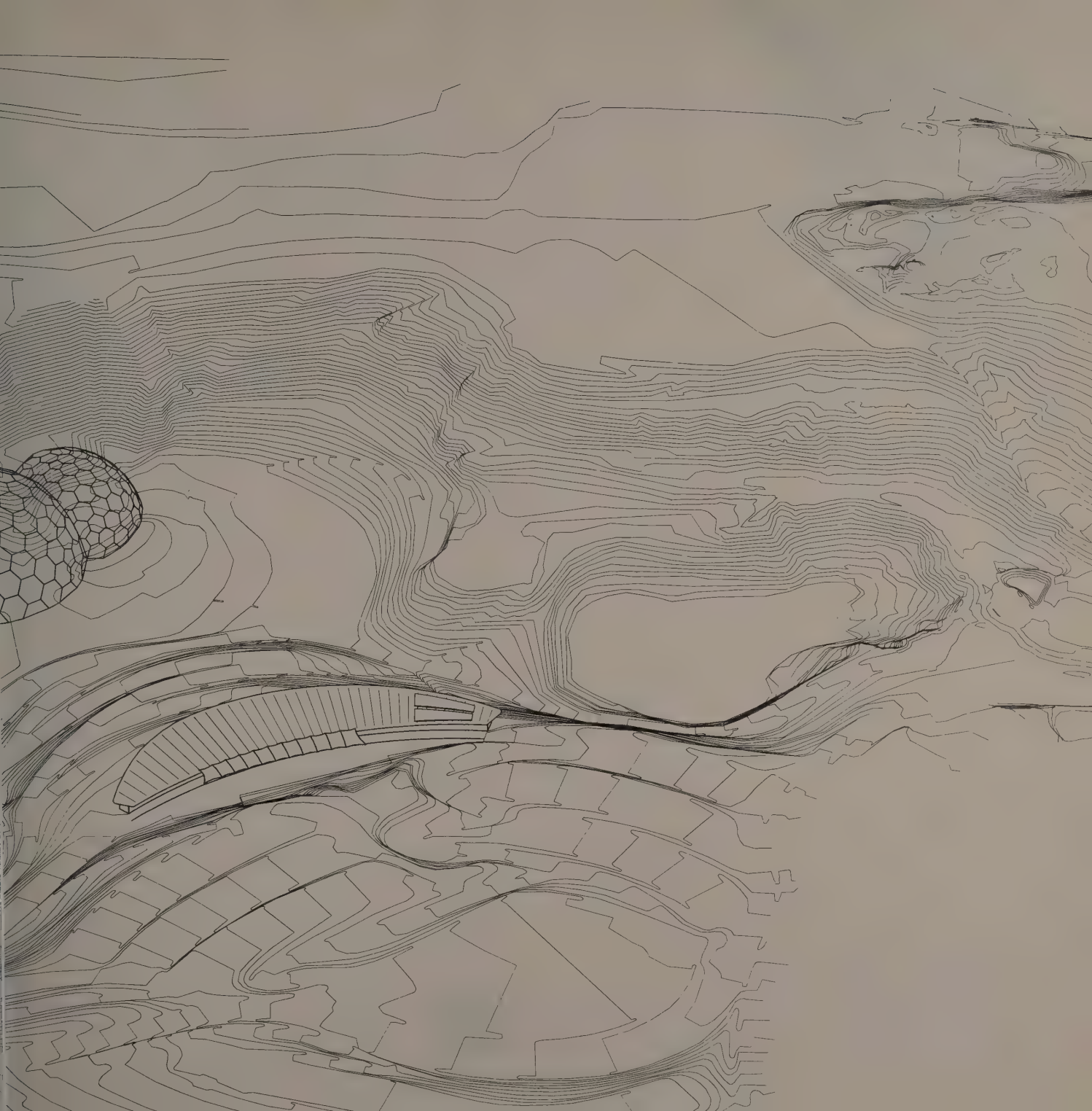
Eden is about making a place rather than just making buildings. The open landscape at the foot of the pit is considered as an overall part of the whole composition, a vast sheltered outdoor room in what is anyway the most benign climate in the UK. This becomes the 'cool temperate' biome. The growth of plant life both inside and outside the domes means that, as time goes by, they will gradually come to resemble giant bubbles perched lightly on the vegetation.

The project represents a fascinating development in the tradition of the British glasshouse. The line of descent runs from the great botanical glasshouses of the early nineteenth century to the exhibition centre of the Crystal Palace of 1851, and on to the iconic railway stations of the following decades. As a tradition, this was picked up and reinterpreted by Grimshaw in the Waterloo International Rail Terminal before the line returned to its roots in the form of a new great 'glasshouse' in the Eden Project. Meanwhile, the dome form had been developed as an appropriate container for several of the world Expos that succeeded 1851, most successfully in Buckminster Fuller's American Pavilion at Expo 67 in Montreal – the year Nicholas Grimshaw began in practice. By combining the forms of the dome with the tradition of the linear glasshouse and the transport building, Eden takes the evolutionary cycle of three building types an important stage further.











**Mabeg Office Building, Soest,
Germany, 1996-99**

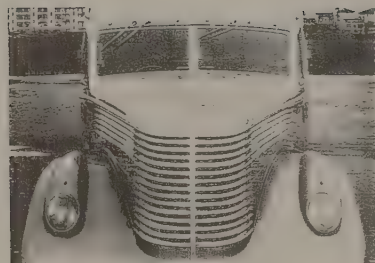
'We were already doing industrial design work for this client, and he had shown enormous enthusiasm for the value of design. I suggested to him that he should have 'a showcase' – a building which was not only good architecture, but which was large-scale industrial design in itself. Thus we hoped to break down the barriers which traditionally existed between architecture and industrial design. He feels we succeeded.

The building has created an image for his company and is something which his architectural clients enjoy seeing. Very much in the tradition of our past industrial buildings, the office uses economic materials to maximum effect and has the flexibility to exhibit Mabeg's constantly changing range of products.' **NG**

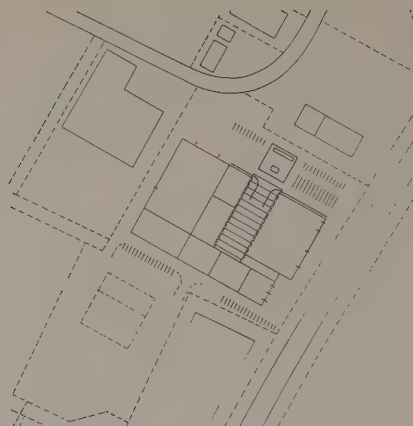


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Corner detail with sun-
shading louvres.

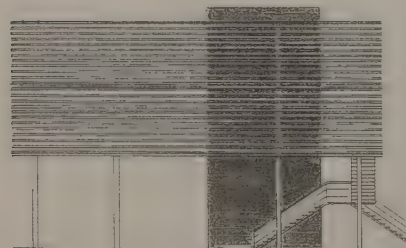
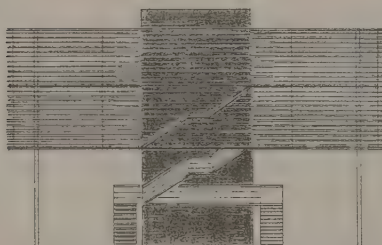
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Site plan showing the office in
its industrial site.



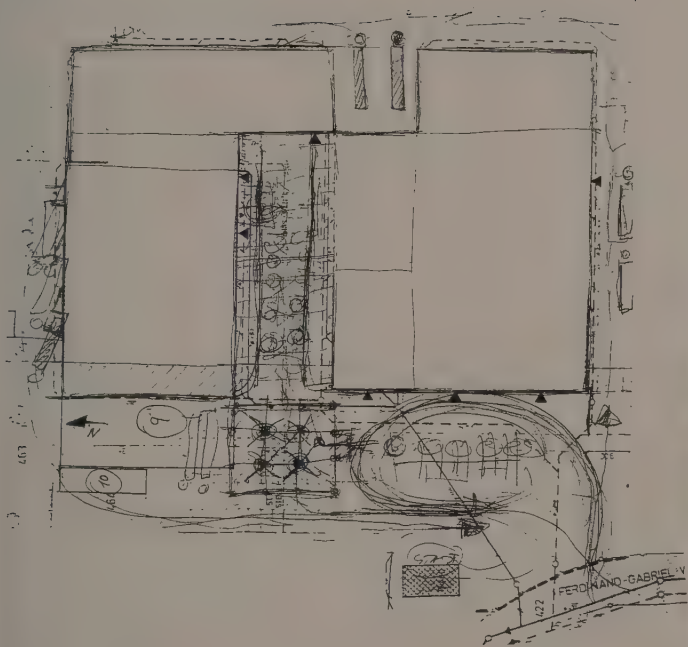
Louvred radiator grille
illustrates the inspiration
behind the characteristic
horizontal ribbing of the
elevations at design
development stage.



In the Grimshaw portfolio of recent buildings, one occasionally encounters unexpected references to earlier – sometimes much earlier – projects in the canon. Thus the Igus factory outside Cologne recalls the aesthetic of the British buildings for Herman Miller, while the new office building for Mabeg carries with it echoes of the Park Road apartment block in London of 1968.

The design of Park Road, a lightweight building enclosure stiffened by a freestanding central service core, was a pioneering concept for housing back then, and too good an idea not to revisit for other purposes. Its horizontal cladding bands of corrugated metal were able to turn the radiused corners neatly, working with the glazing to create a sleek skin. Of course, variants on this aesthetic have been used on numerous Grimshaw projects since – one thinks of the BMW headquarters in Bracknell of 1980 – but never so overtly as here. Mentally slice off all but the bottom two floors of Park Road, perched as they are on slender *piloti*, and you have an object that is uncannily similar to the Mabeg building of thirty years later.

However, Mabeg is as clearly a late 1990s building as Park Road is a late 1960s one. This is due not so much to the planning – for the idea of the free plan around a fixed core is a timeless one – as in the materials, finishes and detailing; the corrugated metal cladding and its fixings at Mabeg, for instance, are considerably more refined than at Park Road. There are proportional and visual differences, too: Mabeg is raised far higher on its *piloti*, to lift it above the roofline of the trucks of this industrial client; the bands of glazing are wider than the spandrels, while



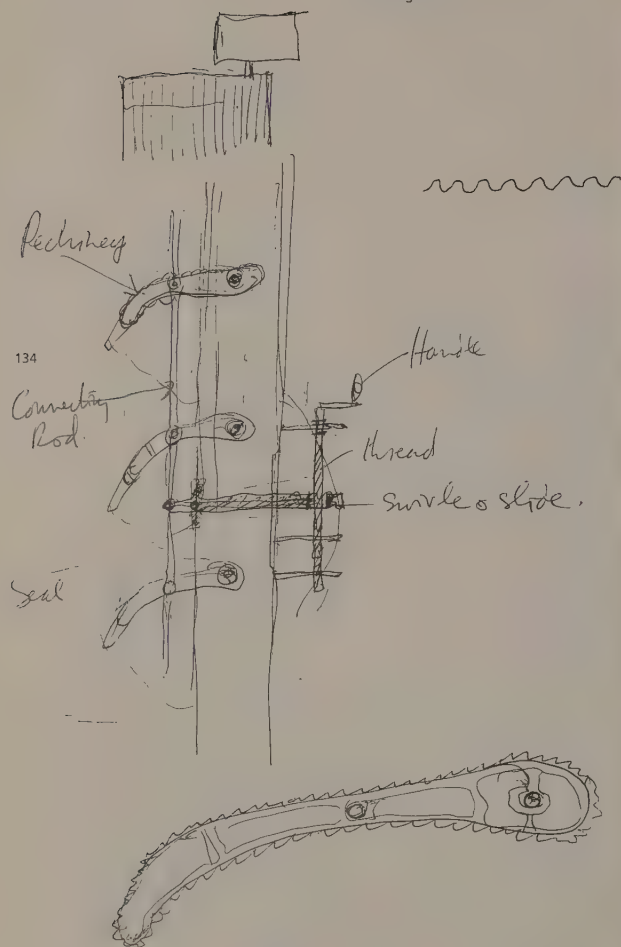
Below left: Nick Grimshaw sketch illustrating the relationship of the office building to warehousing and vehicular routes on the site.

Below: a large-scale model of a corner of the building used to resolve detail design.



Night view of east elevation.

Below: Nick Grimshaw detail sketch of an earlier mechanical version of the sun-shading louvres.









Left: north elevation.

Right: south-east corner.



at Park Road the reverse is true; the service core is offset, rather than being placed centrally; Mabeg sports *brises-soleil* where Park Road does not, and so on. An external staircase is perfectly appropriate, if slightly unusual, for a raised two-storey building: it would be dangerously quixotic on a ten-storey apartment tower. As with certain distinctive motor vehicles (and the louvred radiator grille of a classic truck was one inspiration for Mabeg), it appears that a design evolution, rather than a revolution, has taken place over the three decades that separate these buildings.

The building is linked to an industrial design project – Mabeg is the signage manufacturer for which NGP's Industrial Design Unit produced the Profile One orientation system and its variants. The new headquarters is the first fruit of a 1996 masterplan for the company's whole site at Soest, east of Dortmund in Germany – a plan that rationalizes an industrial site which had, as is typical of most such sites, evolved piecemeal over the years. Each piece in this strategy for future development can be implemented separately, and the 'office box', as it is called, was the first new architectural element to be built.

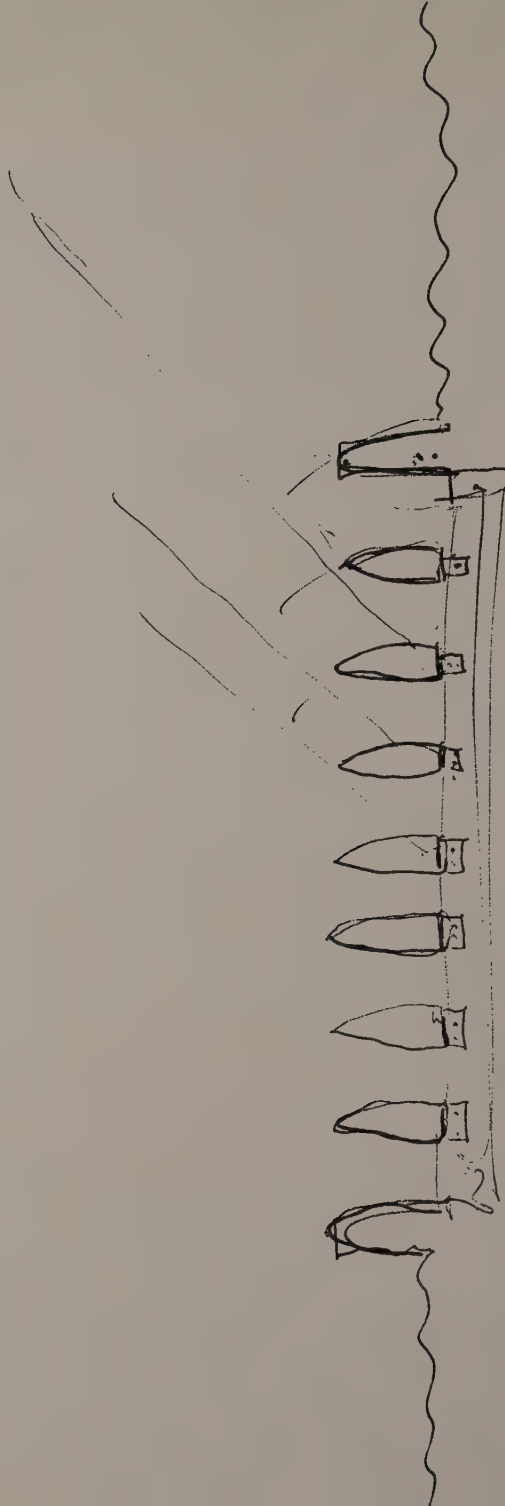
Its image was important: the client wished it to leave a lasting impression on visitors, and for it to become a kind of three-dimensional logo for the company. It thus was designed to perform something of the function of a gatehouse, and will eventually stand at the head of an avenue of new buildings, including an exhibition centre. Being elevated on slender, widely-spaced, 5-m tall columns, trucks can move under the building. This releases valuable space,

on what is a tight site, lit by luminaires set into the soffit, while the possibility of vehicle movement is dramatized by red warning lights at each corner of the building's underside.

The second benefit of its elevated position is that it has a viewpoint over the whole Mabeg site, a useful function for a building that acts as a visitor reception. You gain access to the building either by the lift core (painted in the corporate Mabeg blue) or by an open aluminium staircase fitted into a slot to the rear of the core. Although open to the elements at one side, the staircase has some weather protection in the form of a canopy at eaves level. Its part-exposed nature is acknowledged by the fact that the stair treads are of an aluminium planking used on oil rigs, and the lowest flight can be winched upwards like a drawbridge to deny access out of hours.

Inside, things are kept simple: flexible spaces, arranged on the building's $6\text{m} \times 4.5\text{m}$ grid, can serve as offices or exhibition spaces. The exposed concrete soffit of the ceiling is given an acoustic treatment of perforated plasterboard panels. The NGP-designed Profile One orientation system is much in evidence.

The Mabeg office is a quintessentially Grimshaw building: neat, functional, assured, with just a dash of theatricality. It is, in its way, a self-contained and self-aware expression of the history of the practice.



Nick Grimshaw sketch of the static louvre system.

Detail view of the external staircase on the east side of the building.



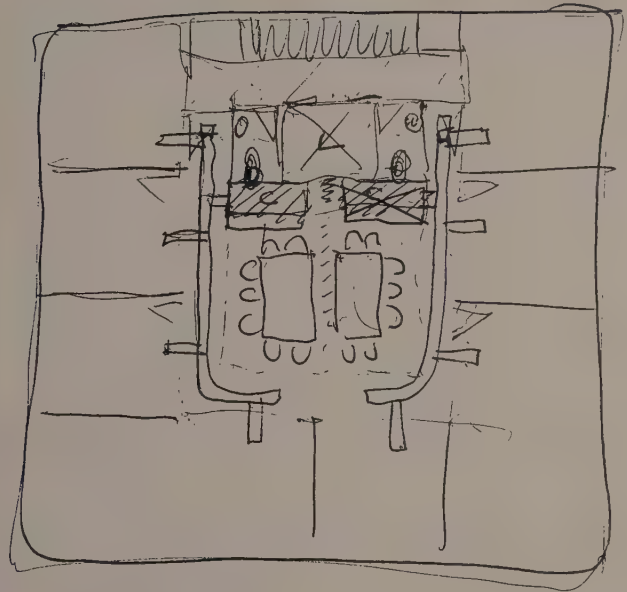


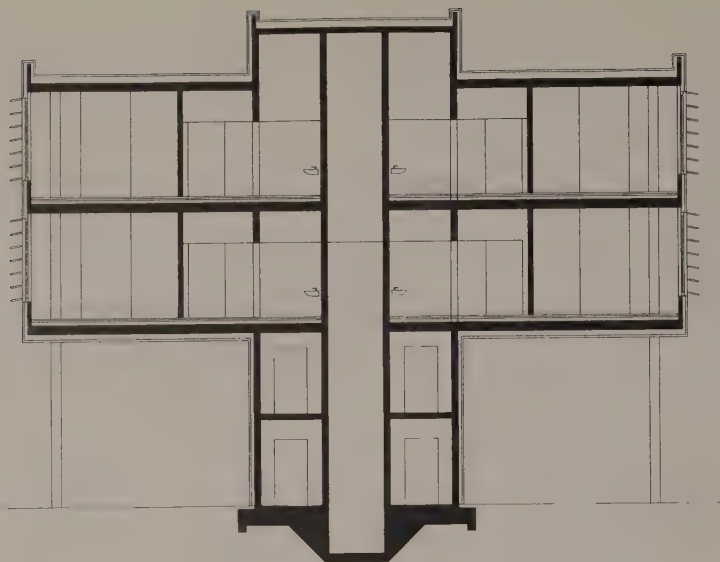


Left: Office interior with Mabeg's Profile One display system visible to the right.

Right: Office interior.

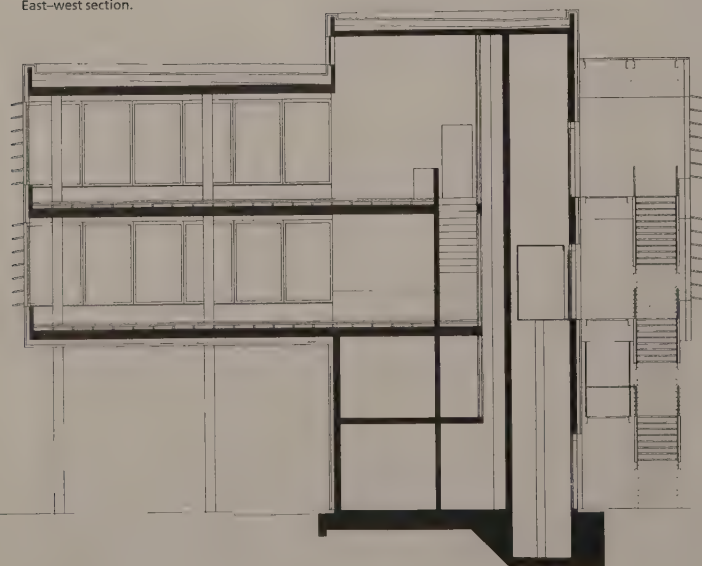
Below: Nick Grimshaw sketch of office floor plan.





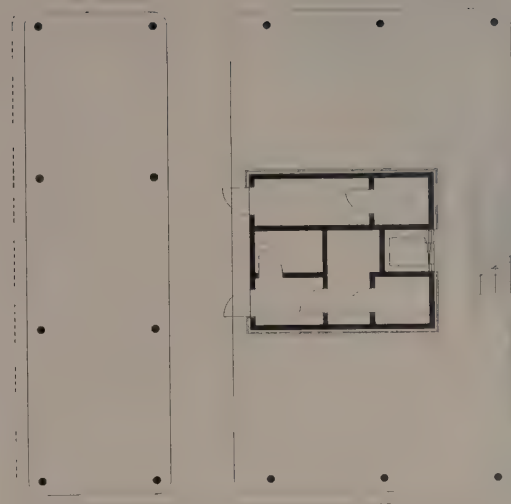
North-south section.

East-west section.





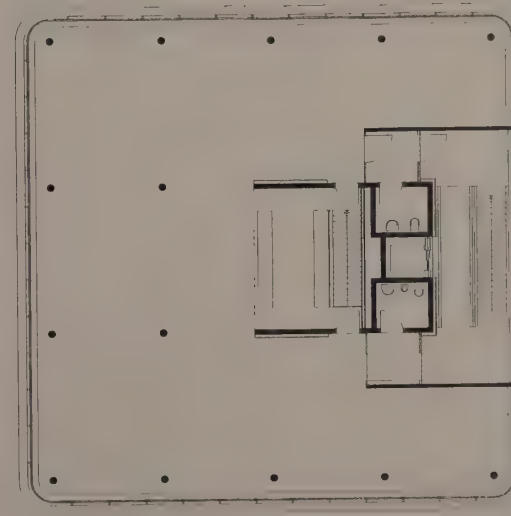
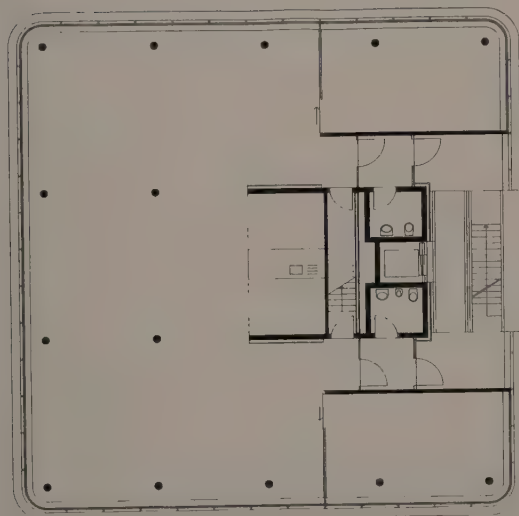
Ground floor plan.



Mezzanine plan.

First floor plan.

Second floor plan.



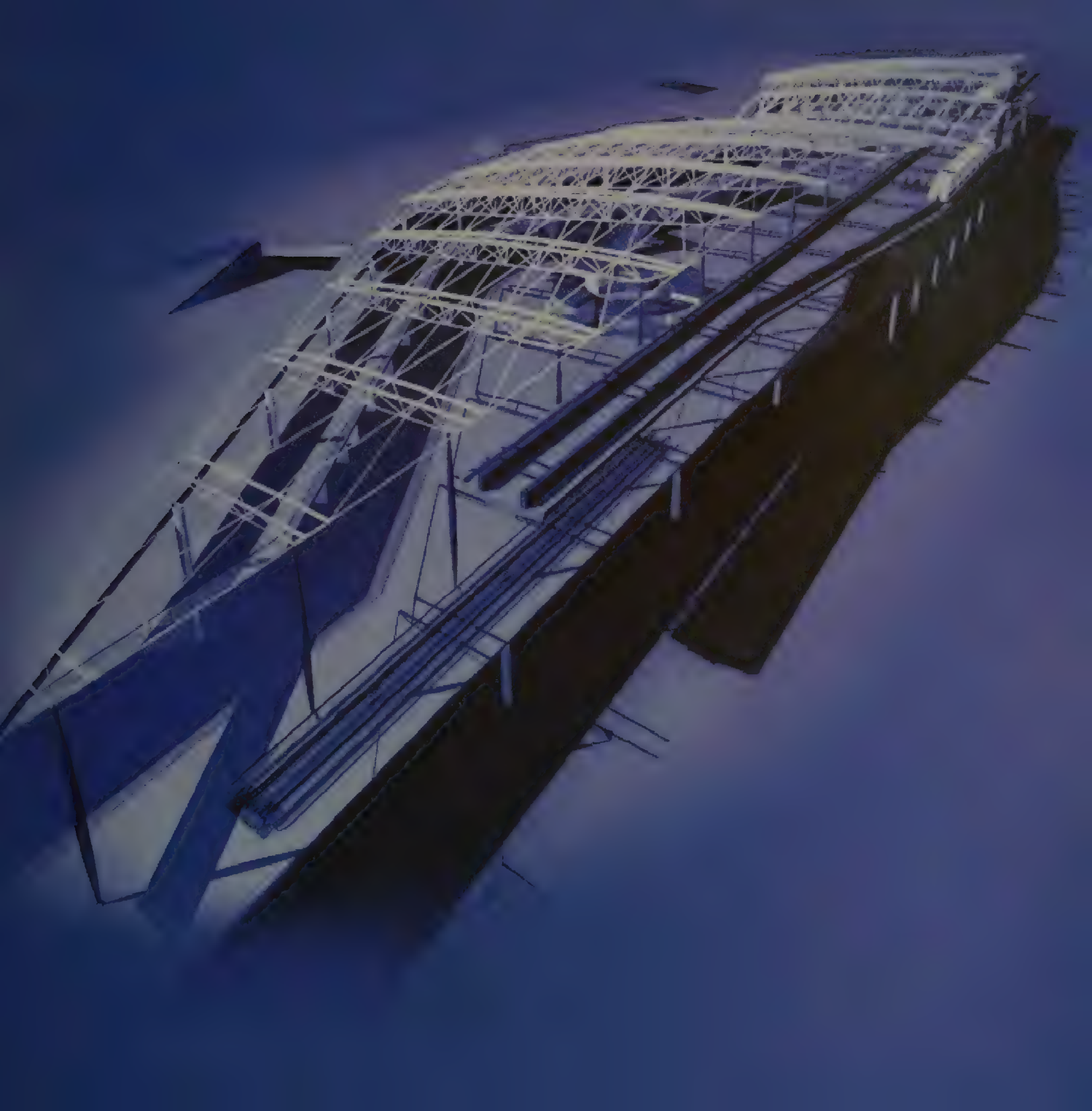


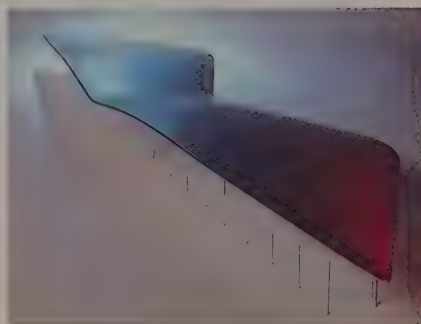
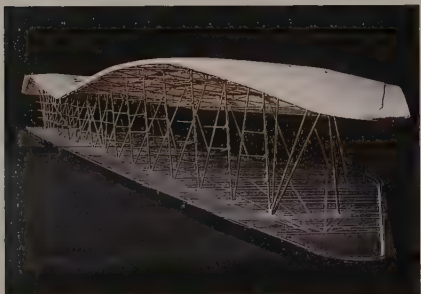
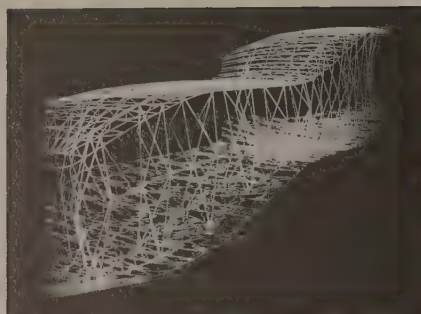
Zurich Airport, 1996-2003

"We presented our design at 8.00 am on a cold winter's morning in Zürich. We finished the presentation in precisely an hour, and the jury's response was silence.

For some reason we were not dismayed by this. We believed in our scheme, and had concentrated on producing a strong-looking form to join together the two sides of the existing airport. This in turn produced a completely new face to the airport for arriving passengers. Our scheme was also economic, providing not a single additional square metre than the brief specified. We did not attempt to re-design the entire airport, as many competitors had been unable to resist doing, and we won the competition.

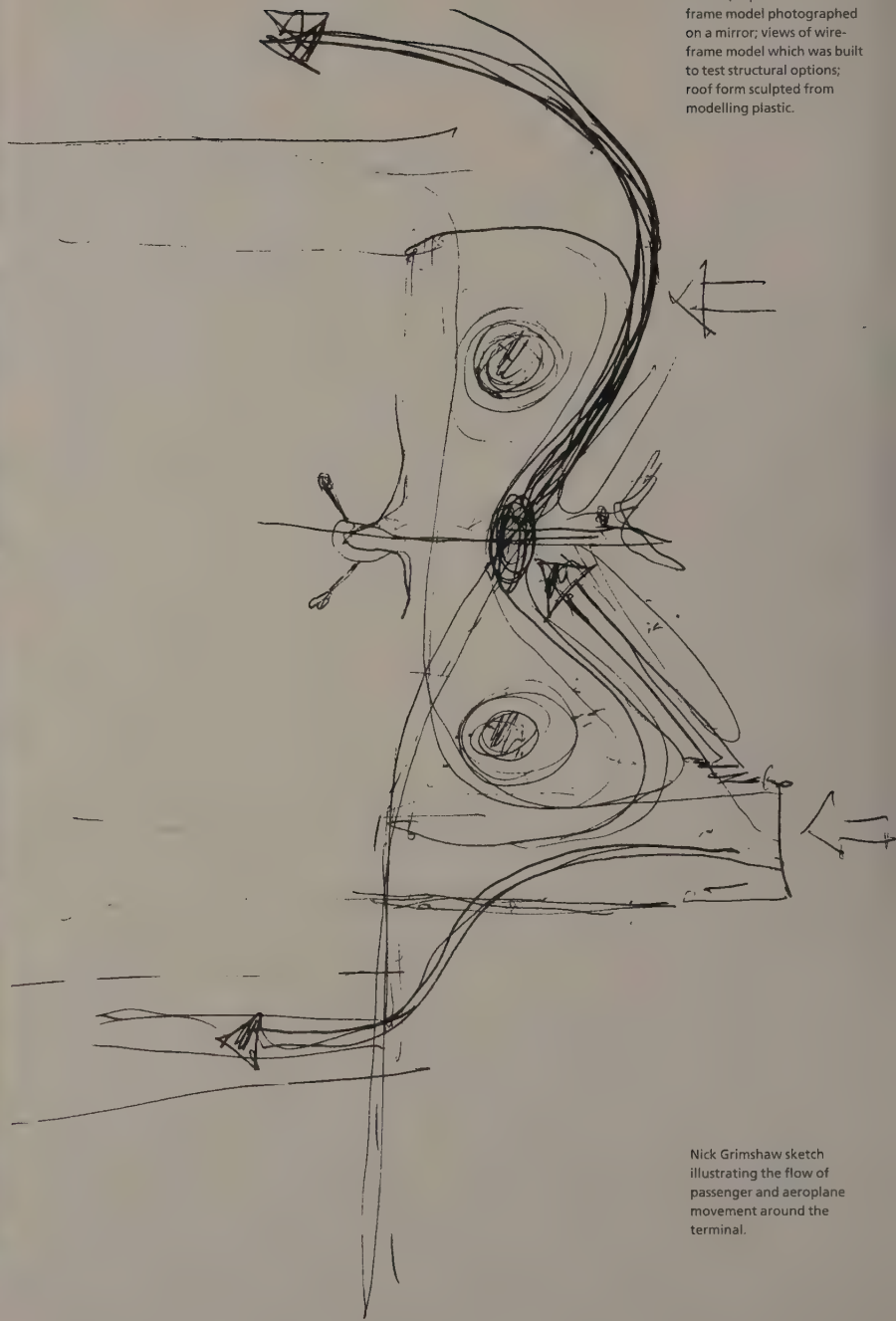
Years have now passed and work will soon start on site. Our basic concept still remains, as long as passengers from around the world notice a strong sense of identity when arriving or departing from Zürich airport, then we will feel that we have succeeded." **NG**





Previous page
Computer rendering of
aerial view.

Far left, top to bottom: wire
frame model photographed
on a mirror; views of wire-
frame model which was built
to test structural options;
roof form sculpted from
modelling plastic.



Nick Grimshaw sketch
illustrating the flow of
passenger and aeroplane
movement around the
terminal.

View of sketch model



Computer-rendered perspective of the airside centre's elevation

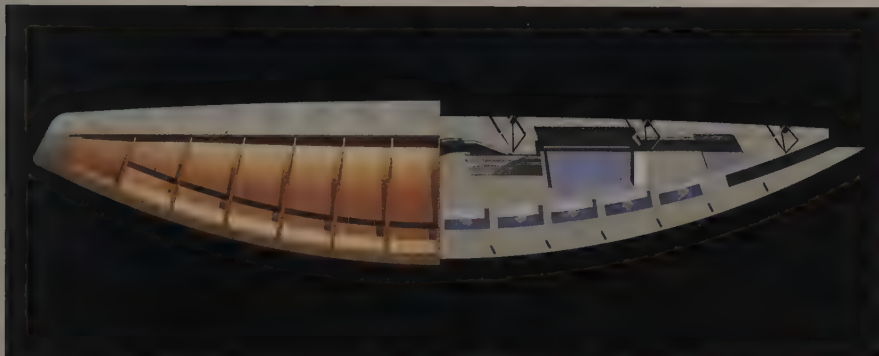
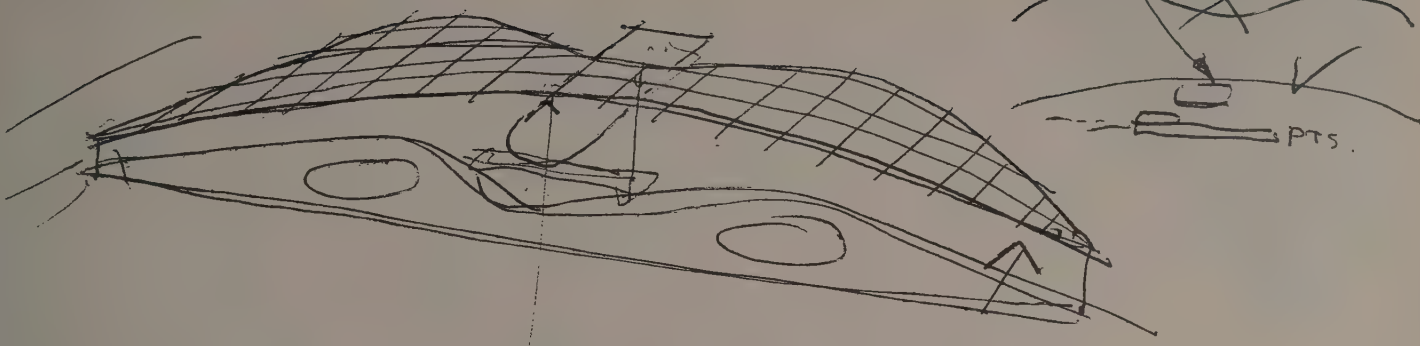


Grimshaw's involvement in airports was, in a sense, kick-started by a speculative scheme for an air terminal exhibited at the Architecture Biennale in Venice in 1991. Taking the form of an elongated torus, the airport was conceived as one vast space with no subsidiary departure gates. Instead, passengers would travel by train system straight to their planes only when they were ready to depart. The dramatically-displayed, raised, tilted and under-lit half-model of the terminal building was the undoubted highlight of the Biennale – and also revealed a roof section which took the form of two great outspread wings. The airport expansion work that followed – at London Heathrow and Manchester – was large in size but not in scale. It was not until NGP won a hard-fought 1996 competition to provide a new passenger centre at Zürich Airport that some of the 1991 ideas could be revisited.

At the time of the commission, Zürich had a throughput of some 18 million passengers a year. The task was to accommodate a rise to 34 million by the early years of the twenty-first century, so consolidating its position as a European hub airport – one where people arrive and leave to go elsewhere without necessarily stopping in the host country. The basic infrastructure of the entire airport was to be upgraded, a new midfield terminal for Swissair's long-haul flights built and – as the key to unlock the whole plan – a new passenger building known as the *flughafenkopf*, or airport head, built. This new building will act as a link between the airport's existing Terminals A and B, with a shuttle link connecting it to the new midfield terminal



Chris Nash sketch of the iconographic roof form.



Split rendering of roof plan and concourse.

Left: Computer rendering showing the location of the new terminal building within the existing airport infrastructure.

Overleaf
Computer rendering of airside elevation.

Like most international airports, Zürich is a complex series of buildings and routes on several levels that has evolved over time – in this case fifty years. It is anything but a virgin site; indeed its unusual configuration, built in an arc around a hill, is famous and represents the only site in Switzerland where enough flat land could be found for a big airport. A great deal of reworking of existing buildings, and dovetailing the old into the new, was involved in the commission. Nonetheless, the main element of the NGP response – the ordering device of the large, enclosed volume with its transit links – can be traced back to the speculative Biennale scheme, and before that to the Waterloo International Rail Terminal in London with its interweaving passenger flows and difficult urban site.

The *flughafenkopf* divides into separate landside and airside centres. The landside centre connects the underground mainline railway with a new check-in hall and shopping mall, while the airside centre is the linking space between the two main terminals, and offers the opportunity to create a large volume, 250m long. Its form – that of a pair of outstretched wings – is in a sense coincidental, since it is derived from a study of the various flows of people through and around the main entry points, which generated a dynamic suggesting the plan, thence the roof.

If an international airport is, in essence, a large town, then the *flughafenkopf* airside centre functions as the town square. Lined with shops at the back with catering outlets above them, it acts as a vantage point at the front, giving an unobstructed view across the airport. The landside centre includes a large new

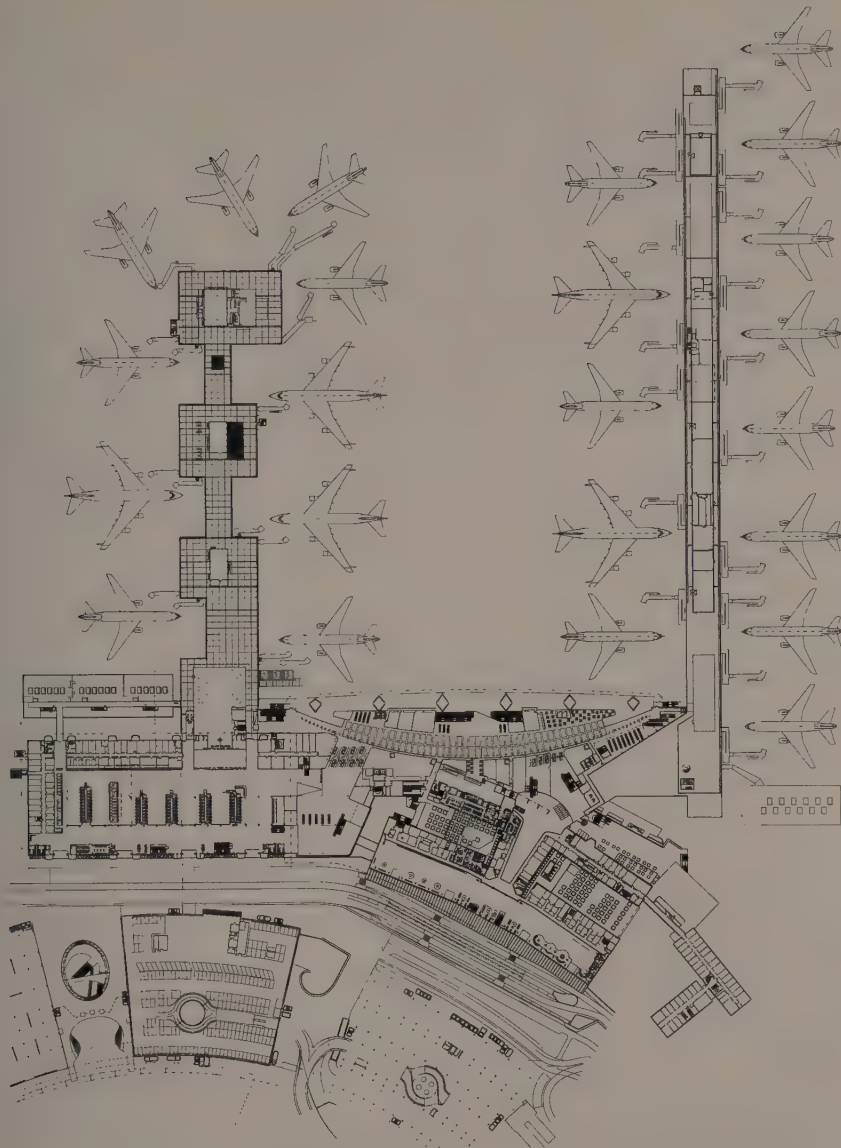






Sections through the new and existing terminals.



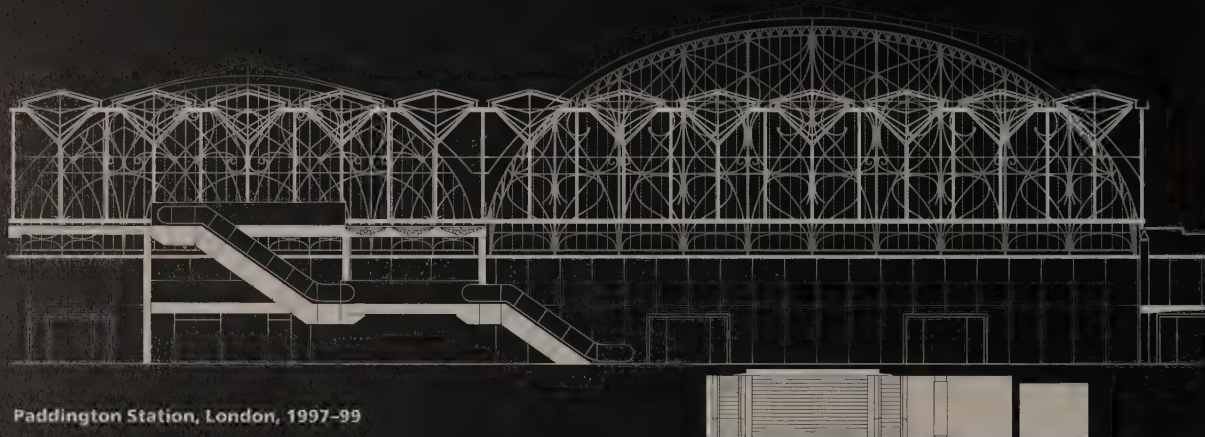


railway station hall on one level and a large shopping centre above, connected with a new regional bus and tram station.

The building is designed to handle both passengers requiring passport control and those who, under the Schengen Treaty, do not. Despite this, the arrivals and departures circulation flows are very direct, each going in a straight line on the stepped gradient between railway station and airside centre.

In many airports, the mechanics of dealing with passenger flow leads to solutions that are almost purely functional. Here, the pragmatic response is elevated by the desire to create a new building with a clear identity and sense of place, not merely a linking device. Central to this, as at Waterloo, is the design of the roof. Its geometry is based on the revolution of a long-sectional curve. Principal steel trusses are set 12m apart and the secondary structure takes the form of a three-dimensional 'net'. Externally, the roof cladding is a standing-seam system. Internally, the acoustic soffit cladding is placed beneath the trusses round the perimeter, but above them in the central areas, so exposing the structure.

Work on both main phases of the building – airside and landside, with its associated railway station and other public transport facilities – is due to start simultaneously in 2001.



Paddington Station, London, 1997-99

'Our railway team, who had been so successful at Waterloo, were intrigued to be working with so famous a structure. Much historical research was done, and we became fundamentally committed to bringing the original Brunel station back to its former glory. This work continues.

Meanwhile, we have designed and seen built a new structure in front of the old station. We believe this is in harmony with Brunel's original structure, and that he would have enjoyed our details and approved of our castings. We hope our grand enclosure is a fitting overture to our work in renewing and revitalizing the station. We intend to prove that a good structure, given care and attention, can be made to last forever.' **NG**





6

Paddington Station

Previous page
Detail of Lawn area truss.

Left: view towards 'town end'
of Paddington Station
showing work underway on
the restoration of the central
Brunel arch.



Andrew Whalley sketch of the
glazed Lawn wall.

One of two Information masts
with plasma display screens
which are positioned at the
'town end' of the concourse.

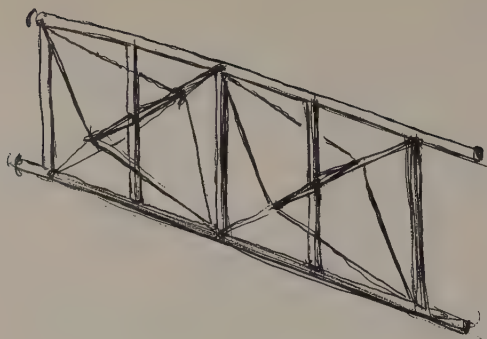
Shortly after the completion of the Waterloo International Rail Terminal, Railtrack – the newly-privatized organization responsible for the infrastructure of the UK's rail network – approached NGP to produce the 'Station 2000' report to advise on the main multi-operator stations on the network. This homed in on three main stations – London Euston, Birmingham New Street and Paddington. Paddington was the first to be selected for further work, as the one under most pressure.

It is true to say that Paddington Station – one of the UK's best and most historically important railway 'cathedrals' – has reverted to the role originally envisaged for it by its engineer, Isambard Kingdom Brunel: that of international gateway. In Brunel's day, one could board a Great Western Railway train to Bristol, transfer to a Brunel steamer and travel to America. Today the trains not only go to Bristol and the West Country, but also, via a new express rail link, to Heathrow Airport. Thus the station has effectively become a detached part of the airport, with rows of check-in desks and its own dedicated shuttle service. But it also remains one of the most important termini for rail journeys within the UK, and a complex transport interchange with the Underground network and surrounding roads.

Originally built in 1850–54 by Brunel with his architect Matthew Digby Wyatt and designer Owen Jones – both previously involved with Paxton's Crystal Palace for the Great Exhibition of 1851 – the station is organized with three parallel naves and two broad transepts, its bulk part-sunk into the ground; it is a revelatory space to enter. Over the years, however,



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Left: Andrew Whalley sketch of the Lawn roof truss.

Below: aerial view of the Lawn roof under construction.

Right: the new Lawn area roof juxtaposed with the restored Brunel arches.

the station had become cluttered with *ad hoc* additions and was in dire need of reorganization – not least in order to make room for the vital new Heathrow Express with all its traffic-relieving implications. Passenger traffic through the station was also scheduled to increase dramatically due to big new office, retail and residential developments in the area. Railtrack accordingly made the terminus the flagship of its £1 billion station regeneration programme, to be carried out nationwide.

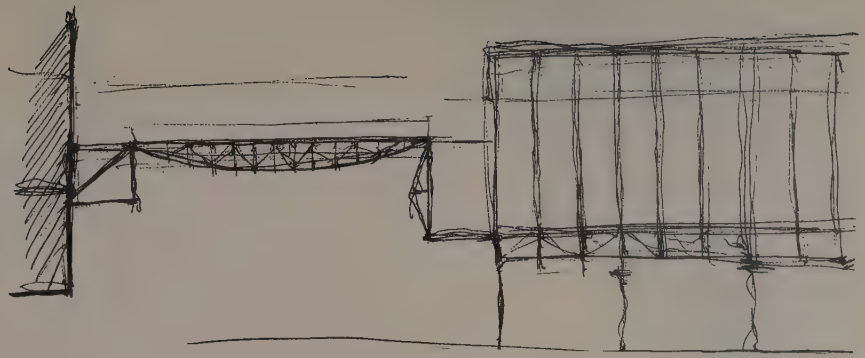
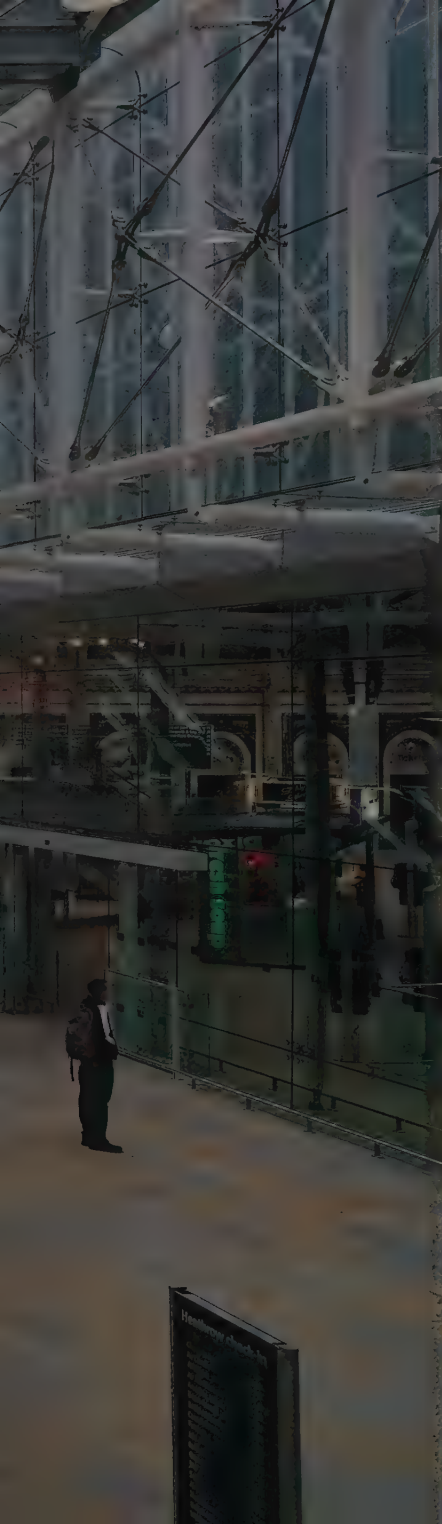
In 1996, NGP developed a phased masterplan for the redevelopment of the station; work commenced soon after. First the platforms were reordered to accommodate the Heathrow Express with its temporary airline check-in buildings – which meant rerouting taxis that had previously driven right through the middle of the station. Then a large new structure was inserted at the back of the concourse to provide more facilities and free-up space in the main terminal area – already prone to overcrowding at peak times. The final phase envisages removing the later 1916 train shed at one side in order to allow a better Underground/rail interchange and an air-rights development over the tracks outside the curtilage of the original Brunel/Wyatt building.

The key to the NGP reorganization is the major surgery that took place in the area still nostalgically referred to as 'The Lawn' – the very head of the concourse, spliced into the 1930s rear of the original nineteenth-century Great Western Hotel. Originally the station, which is still entered from the sides, had no concourse at its head at all, and drawbridges were necessary to cross from platform to platform: with its









Left and right: the Lawn area with mezzanine and ground level cafés.

Above: Andrew Whalley sketch of the Lawn roof.



cranes, turntables and smoke, this was a palace for machines as much as for people. The Lawn – thought to have originally been just that, perhaps belonging to the stationmaster – lies outside the top end of the Brunel/Wyatt sheds. As a consequence, a large new building was able to be shoehorned into a very restricted space between the sheds and the station hotel in such a way as to enhance both. Its two levels accommodate shops, restaurants and a full-scale, 27-desk airline check-in, complete with a baggage tunnel leading under the tracks to the Heathrow trains.

The new building's tubular-steel roof structure is related to Brunel's original ridge-and-furrow system borrowed from the slightly earlier Crystal Palace, but done in a low-key way so as not to compete with the main event. The upper level is in precast concrete with inset glass lenses, while links across are via glass-floored bridges. By concentrating the retail and check-in activities here, providing more circulation space and re-establishing the entrance to the Underground right on the axis of the central arch, Brunel's building is revealed much more clearly. The only additions made to the general concourse area are four steel and glass 'pod' retail buildings – two of which acted temporarily as ticketing and check-in centres for the Heathrow Express. Once the new check-in was completed, these pods took on new uses.

An example of the tidying-up work that formed part of the £40 million total is the replacement of the old central departures/arrivals boards with an airport-type system of flat-screen monitors. These are arranged both in purpose-designed banks to either side of the concourse, and as individual units dotted

Lawn roof components assembled.

Component prototypes were manufactured using three different methods. The method selected for production was machine welding (right-hand side component).



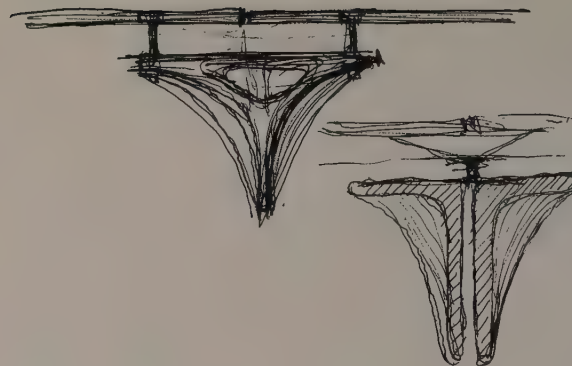
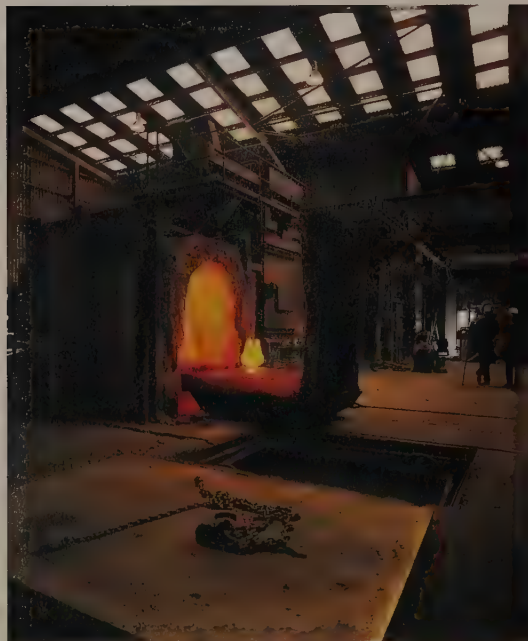
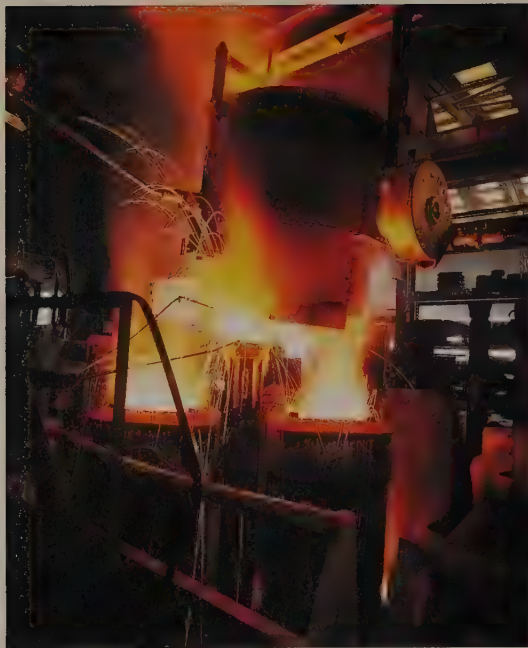




Plasma screens with light shields beneath the train shed roof.

A smaller version of the 'totemic' transport information mast. These are located at intervals along each platform and supplement the main information masts on the concourse.





at key points throughout the complex. Thus distributed, the monitors cease to dominate the space and allow free views through to the restored structure with its Wyatt/Owen decorative ironwork. The new concourse is floored in pale limestone.

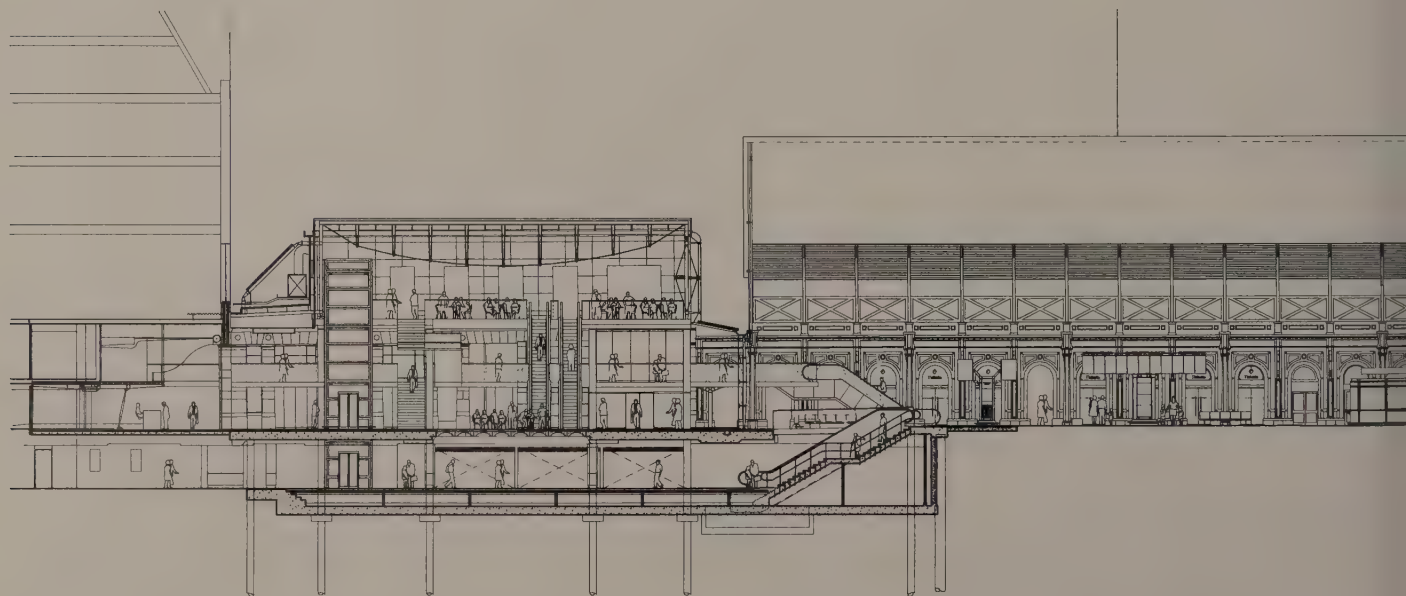
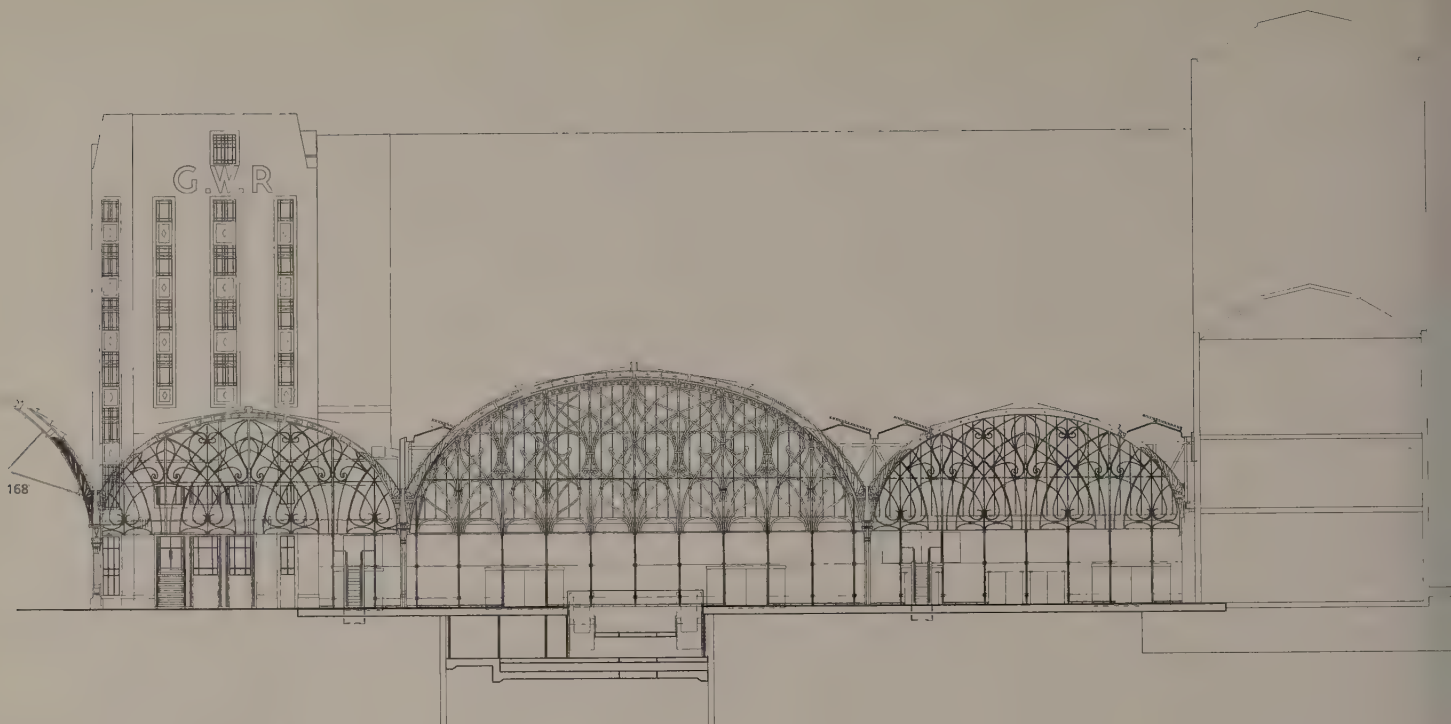
The Paddington work bears some similarities to Waterloo in its organizational layout, but here the task was very different – rather than graft on a complete and very distinct new building, the job was to work sensitively within a Grade I listed historic structure. The impact, however, is no less: you appreciate the old architecture from a new standpoint. The second phase of the work, which involves a great deal of new building to the side, will alter our perceptions still further.

Above: Andrew Whalley sketch of a roof component.

Left: casting one of the Lawn roof components.

Right: tie component of the Lawn area roof.



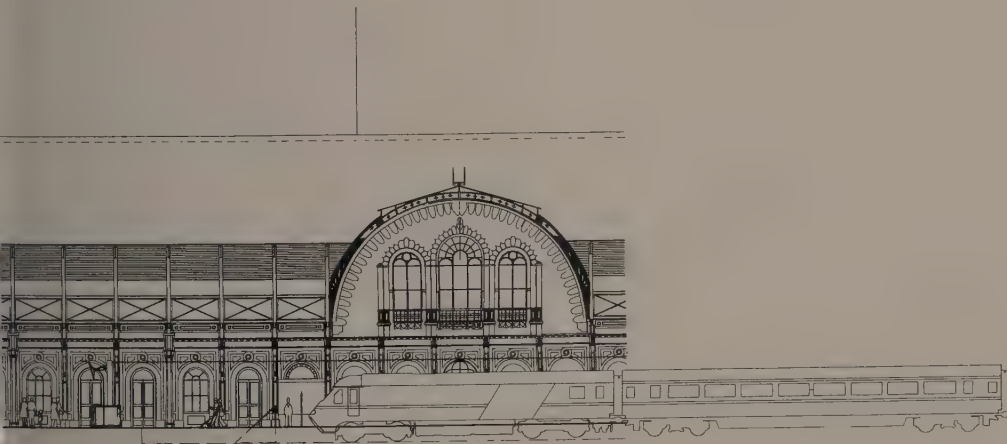




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Section showing restored Wyatt/Owen decorative ironwork in front of the new lawn roof.

Section through lawn area and restored train shed.





**Victoria & Albert Museum Extension,
London, 1996**

'This was a high-profile competition. The brief was very specific – to describe and bring alive the wealth of material in the V&A, and also to provide a focal point for the existing museum which would become a new entrance. We had many brain-storming sessions stretching long into the night. How could we make sense of this vast rambling building with its 15 kilometres of corridors? How could we display artefacts ranging from the popular to the esoteric? And how could we bring power and focus to what was, in effect, a side entrance to the museum? In the end we proposed a beautifully detailed cube with a dynamic ever-changing surface. The modules making up the facades could be video projections or 'shop windows' which revealed valuable objects from within the collection. The glass could be clear or opaque. The whole could be controlled by a lap-top computer carried by the curator of the exhibitions on the train to work. This cube certainly brought the museum alive. It created a focus.' **NG**





Nick Grimshaw sketch exploring the relationship between the street and the sunken cube.

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Computer-rendered illustration showing the proposed Exhibition Road elevation.

Above: the site – a space between two wings of the museum opening on to Exhibition Road.

Below: east-west section in relief looking north through to the proposed cube showing its relationship with the existing museum buildings.

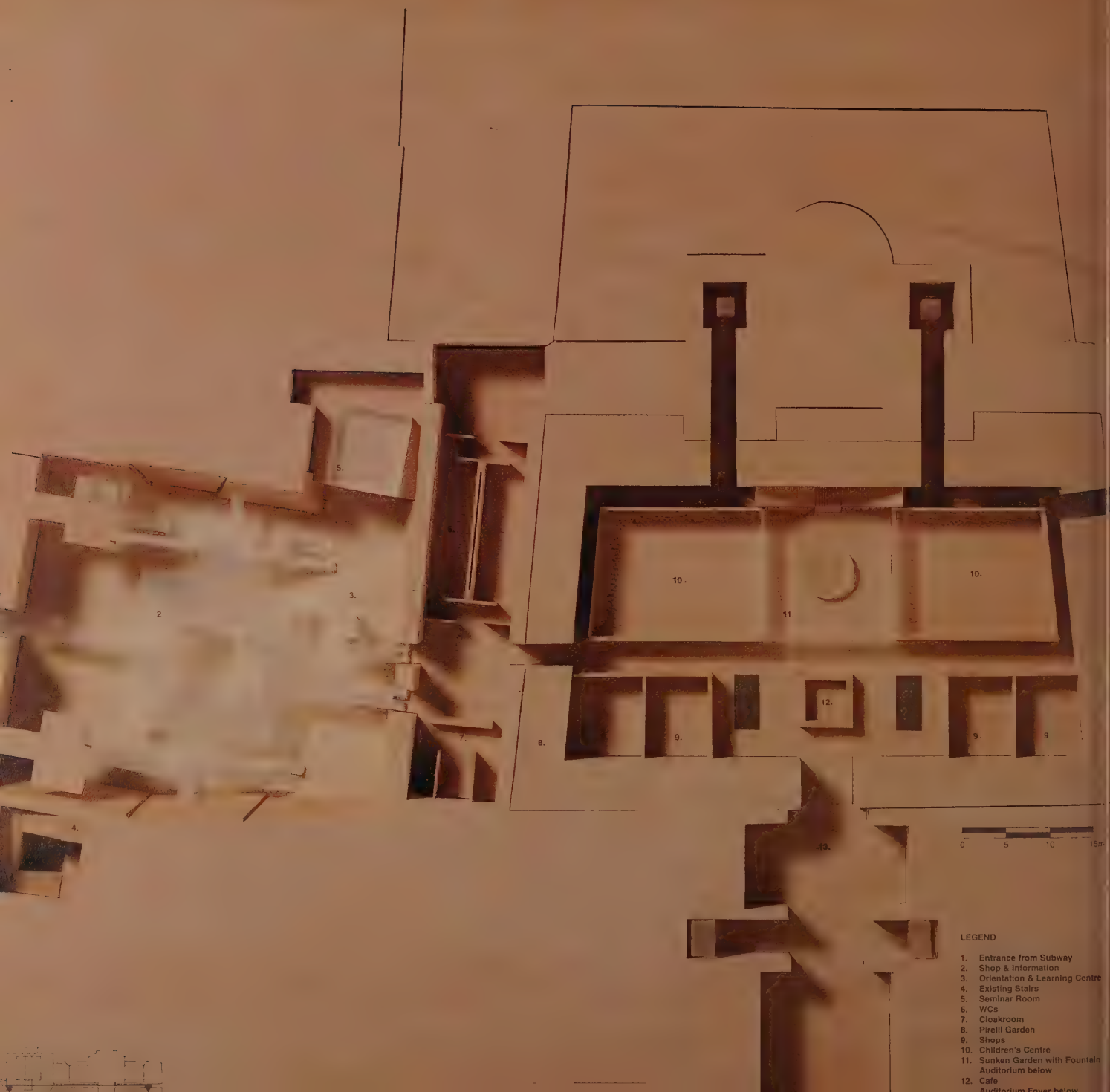




This scheme was an earlier exercise in creating a cube building, and using lighting effects, in a highly sensitive historic setting: not the Georgian context of Bath Spa, but the High Victorian surroundings of London's Victoria & Albert Museum. Highly placed in the competition for an extension building in the former boilerhouse yard of the museum, the unrealized project was instrumental in evolving ideas for cultural buildings, and for the development of adaptive-skin facades for all purposes.

The rationale behind the V&A design was to link and reveal the two wings of the museum that were disconnected, and to do this by means of an object which in its static state was neutral, but which came alive as a medium for lighting, projection and display. As a transparent object, it would serve to present items from the V&A's vast collection to the outside world, but as important were the craft aspects of the project. True to the ideals of Henry Cole, the nineteenth-century design guru who was the driving force behind the museum, the building itself would become an expression of craft skills. All details, components and castings thus become demonstration objects – something that is in the nature of the Grimshaw practice.

In a manner reminiscent of the later Bath Spa project, the building takes the form of a cube of accommodation set within a glass casing – here a larger, transparent cube rather than the looser-fit casing of Bath. One of the ingenuities of the scheme is the way it is subservient in massing terms to the existing buildings – being set back slightly from the street line, sunk two levels into the ground, and with

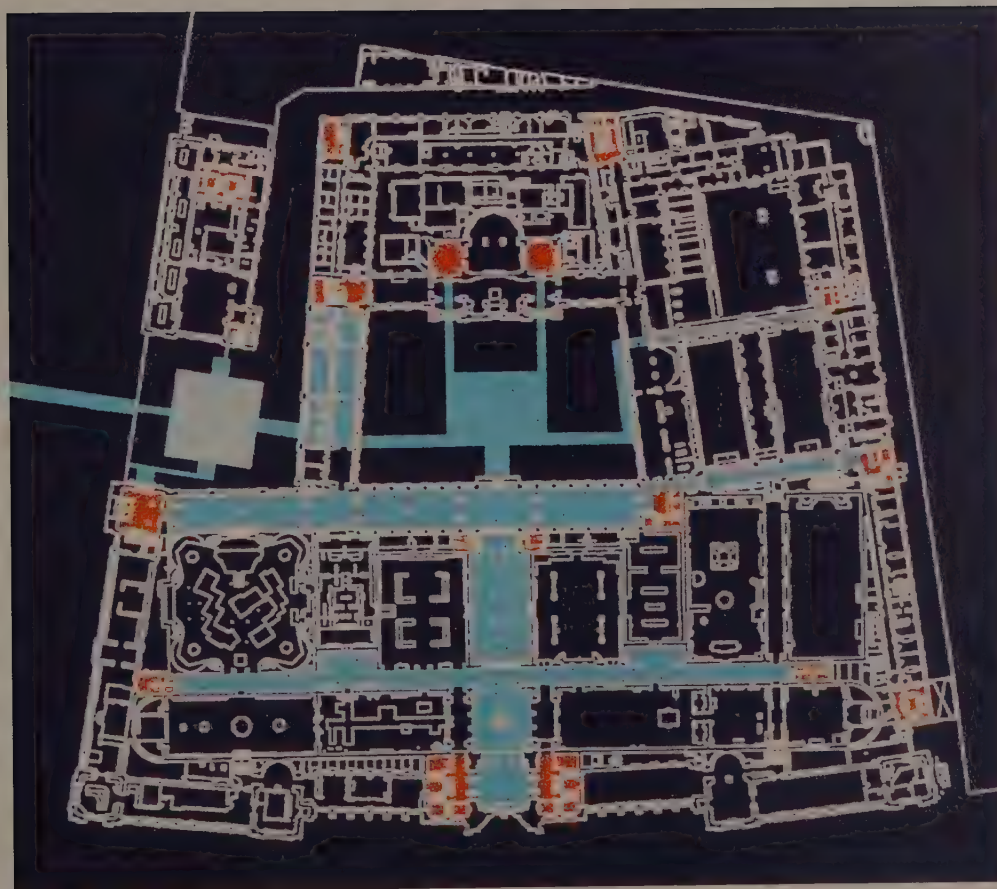


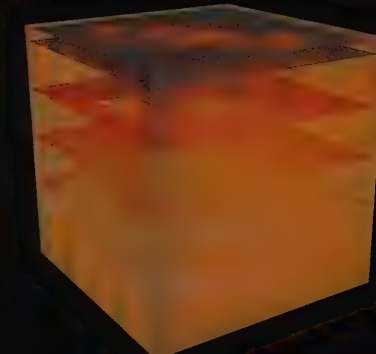
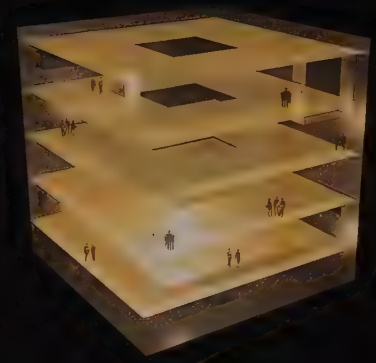
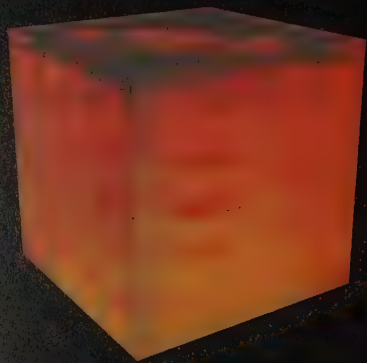
LEGEND

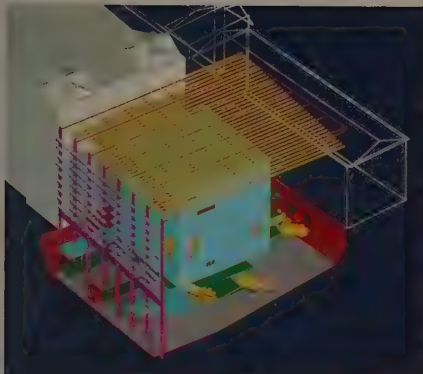
1. Entrance from Subway
2. Shop & Information
3. Orientation & Learning Centre
4. Existing Stairs
5. Seminar Room
6. WCs
7. Cloakroom
8. Pirelli Garden
9. Shops
10. Children's Centre
11. Sunken Garden with Fountain
Auditorium below
12. Cafe
- Auditorium Floor below

Plan in relief showing the proposal in relation to the existing organization of gallery spaces at the V&A.

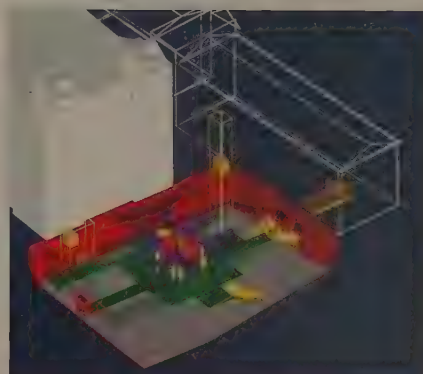
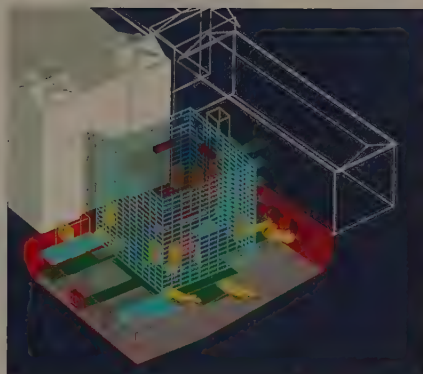
Plan of the V&A Museum.







Left: these computer-rendered illustrations explore the potential treatment of the cube's interactive surface.



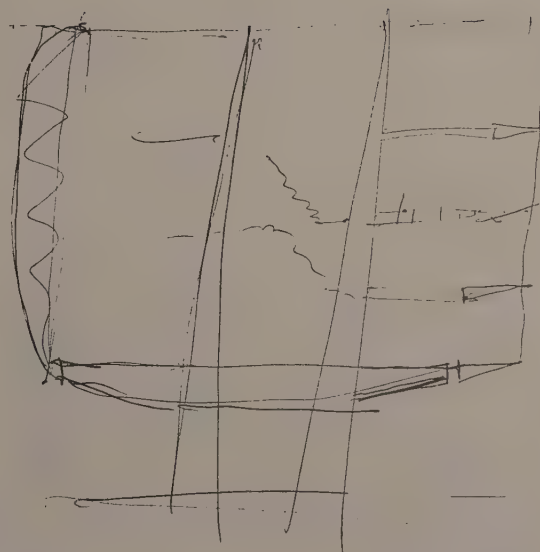
Three stills from a 3-D model created to present the organization of spaces in the gallery.

Nick Grimshaw sketch exploring the structure of the glazed cube.

its roof plane set at the height of the cornice of the Henry Cole wing – while being an assertive object in its own right.

This box-in-a-box design provides a breathing space between old and new buildings and allows daylight down to the lower levels, where the cube form hovers overhead supported on a grouping of columns – again like Bath. The existing Aston Webb screen across the front of the site – fine for hiding a boilerhouse, but scarcely suitable as the entrance to a new building – would be taken down, turned round and reused against the streetside retaining wall below ground level. There, it would act both as a memorial to itself and as an entrance arch to the Edwardian below-ground walkway which links the South Kensington museums with the Underground rail network.

The glass cube would do rather more than add accommodation to the already sprawling V&A complex. Instead, it would serve to clarify the existing museum, rather as the 1989 glass pyramid at the Louvre in Paris, with its associated undercroft, orientates the visitor in a manner that is both logical and dramatic. Where the Louvre pyramid is a centrally-placed building accessed from the side, the V&A proposal was for the landmark building to be placed at the side, leading visitors through into the museum's central courtyard – the Pirelli Gardens – as the central distribution and orientation point. Otherwise the courtyard – the obvious place for this function – would be severely under-used. The proposal was not to build a huge undercroft beneath the courtyard, but to lower it and use its surface – still a garden – for the purpose.



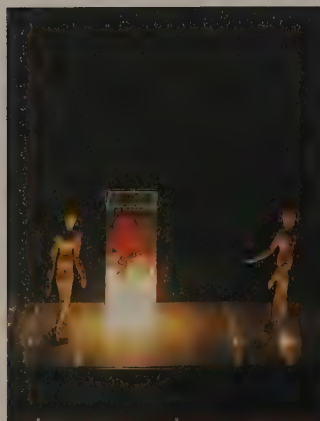


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Above: Nick Grimshaw sketch of the existing Aston Webb screen on Exhibition Road. The proposal included moving this screen to below street level.

Views of model made to present the qualities of the building's interactive skin.



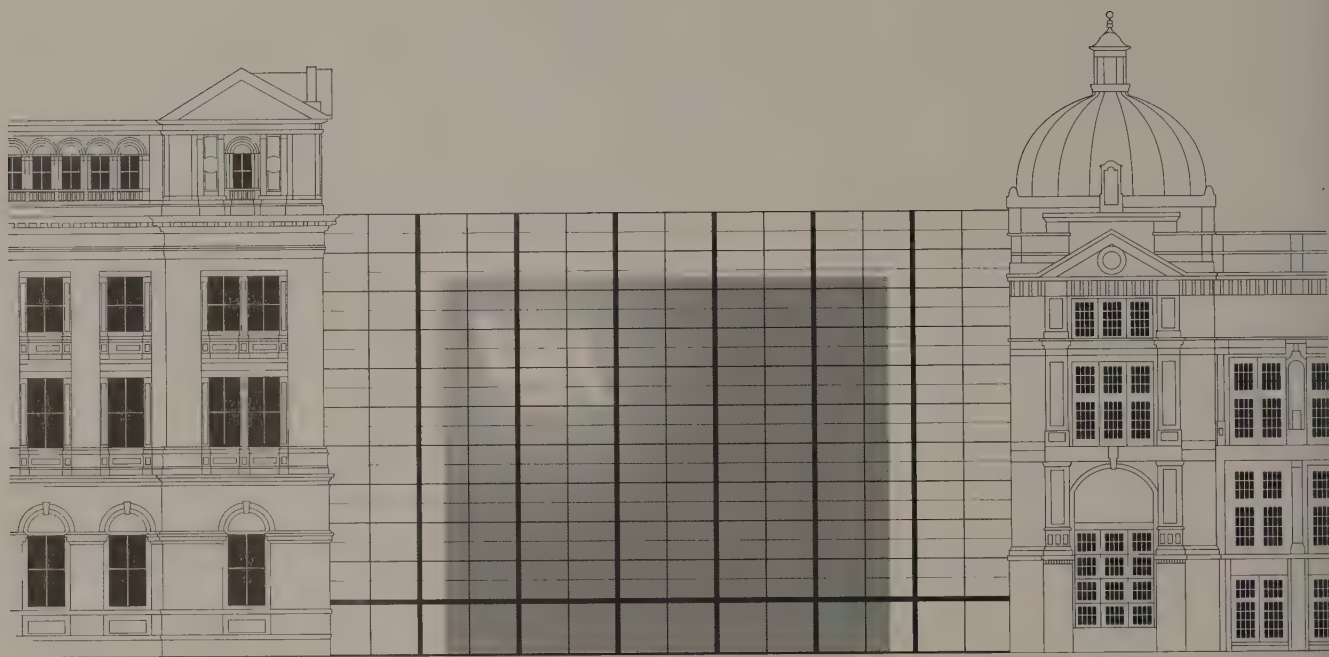
Anya Gallacio's ice sculpture, *Intensities and Surfaces*, exhibited at Wapping Pumping Station, 1996.

The project advances the art of 'intelligent' glass cladding. Grimshaw envisaged a triple-layer skin: the outer layer to be clear and single-glazed, the central layer to consist of a liquid-crystal sandwich allowing it to transform in stages from clear to opaque, and the innermost layer to be electronically-operated blackout blinds. As a result, the skin could be totally transparent, partially transparent, opaque but translucent, or opaque and blacked-out. Each panel of the facade could work independently – for instance allowing a key object to be displayed to the outside world, or the whole arrangement could be orchestrated in order to create a large-scale visual effect. In its translucent state, the wall would act as a backdrop for still and moving images to be projected onto the Exhibition Road facade. And whatever the state of the facade, daylight would penetrate the heart of the cube via a central lightwell roofed in prismatic glass.

The later experience of the Bath Spa project – in one of the most sensitive historic urban sites in the country – provides proof that this approach is thoroughly suitable. By using the new to reveal and enhance the old, and by removing the artificial distinctions between the two, the overall cause of architecture and urbanism clearly benefits. Respect for context need mean neither slavish imitation nor over-deference; the architectures of different generations are generally both tough and adaptable, quite capable of learning from each other.

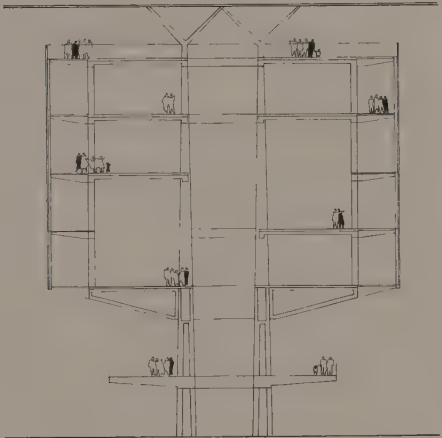
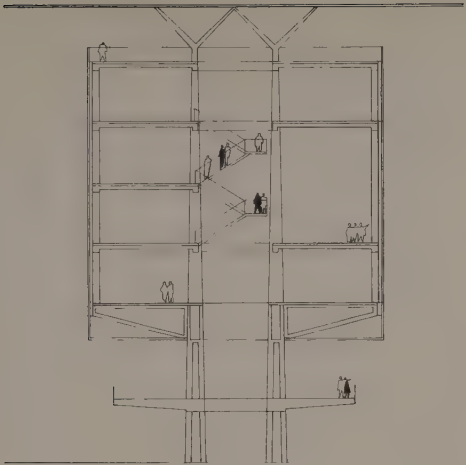
The Exhibition Road elevation at night.



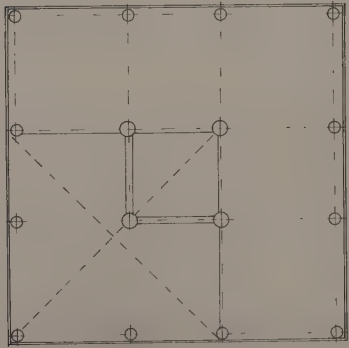


Exhibition Road elevation.

Options for the section showing flexibility of the structure for exhibitions and possibility of expansion.



Plan option for a flexible floor plate.





**Spine House, Oberkülheim,
Germany, 1996–2000**

"The clients were working 16 hours a day. They were running a dynamic and fast-growing business (in a building we had designed), and yet they were living in a rented house. I said to the clients one evening, "You can't live like this. You must, at least, give yourselves a home environment as good as that at work. Somewhere to relax, with a beautiful view and where you can surround yourself with your own possessions – a house with a strong identity." After many, many design sessions the house is going ahead. It has a pool and squash court, and a fantastic view. The spine rises away from the hillside like the fuselage of an aeroplane and the views from the 'cockpit' are spectacular. All the circulation and servicing is housed in the spine. The surrounding spaces are quiet, rectilinear and contemplative. I suppose it's essential to identify with the clients when designing an individual house, and I think it will really suit them. However, I'd love to live there myself." **NG**



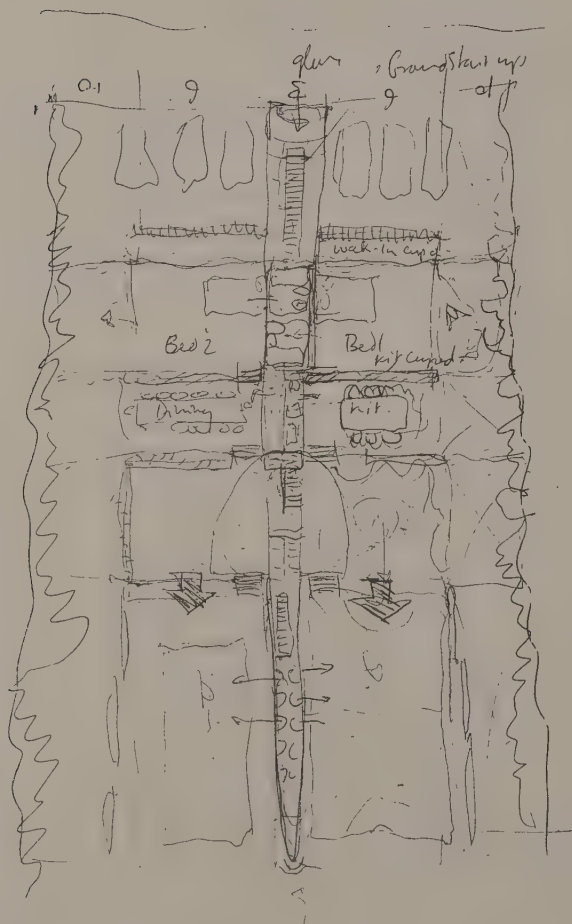


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Detail of an early working model built to explain the spatial organization to the clients.

Left: 'Spine' element removed from the working model.

Below: Nick Grimshaw sketch of the house and the landscaped exterior spaces around it.



It is strange to think that the Spine House, commissioned in 1996 and built during 1999, is the first one-off house the Grimshaw practice has produced in over thirty years. Previous forays into the domestic area have concerned co-operative housing, as in the early Park Road apartment tower, or speculative private units, as in the Grand Union Walk row houses of 1986–88 – both in London. And, of course, one must not forget the earliest project of all, the spiral form of the 1967 Student Hostel Service Tower with its fibreglass bathroom pods. However, the development of the practice swiftly moved into other areas – particularly, in the early years, industrial buildings – bypassing the smaller-scale homes that are the lot of many young architects. Given this, there is a satisfying balance in the fact that it was a later industrial client who commissioned the Spine House, so allowing Grimshaw to become personally involved in this area of design for the first time.

The clients concerned, Frank and Daniela Blase, are respectively son and daughter-in-law of Günter Blase who commissioned the 1992 Igus factory outside Cologne. Günter and Frank have worked as a team since 1983, while Daniela heads the computer side of the business. Grimshaw enjoys a close relationship with the young Blases and seems to be regarded as the wise English uncle. The way he tells it, he became concerned at Frank's workaholicism, took him aside and told him he needed a project away from Igus. Better to build a home and swimming pool while young and fit, Grimshaw advised; that way, he would get a lifetime of enjoyment rather than the more usual retirement retreat after a lifetime of pressure.

Site plan showing landscape proposals.

Plan view of the working model. The two halves of the house on either side of the circulation spine are splayed to encompass the view to the south.

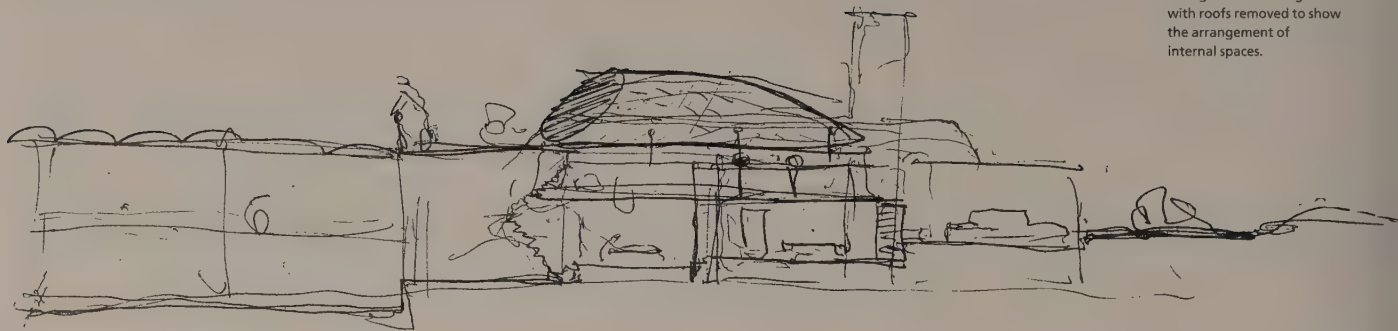


The Blases agreed and in 1996, after several years of searching, a site was found on sloping pastureland with a distant view of Cologne, in a small scattering of otherwise unremarkable buildings. It was then that they approached Grimshaw to design the house. If the project was a big one for the Blases, it was equally important for Grimshaw, for this gave him the chance at last to reinvent the idea of the house.

A novel working method was adopted. Early designs were done by Grimshaw with architects Mark Bryden and Martin Wood. When Bryden and Wood left to set up their own practice, the relationship continued unchanged, save for the fact that the production of working drawings and the supervision on site transferred from NGP to Bryden Wood. The 1996 Grimshaw sketches show that the concept crystallized quickly: two wings of accommodation joined by a long element – the spine – aimed squarely at the distant view and offering within and around itself a completely different environment. The spine is not a structural element, since the wings to either side are free-standing: rather it is a curvilinear volumetric form that acts as a foil to the rectilinear spaces.

As the design developed, this defining feature grew in importance. In the final design, the wings are skewed slightly to create a central splay in the house, allowing the spine to widen towards the south. Made in eight timber pieces – laminated rib sections supporting carvel-built timber cladding that is seen from both inside and out – the spine became a relatively complex element that was made in a boatyard, trucked to the site and assembled. In contrast, the wings of accommodation were made in

An early Nick Grimshaw sketch section exploring the treatment of changes in level across the site.



Right: Nick Grimshaw axonometric sketch.

Far right: the working model with roofs removed to show the arrangement of internal spaces.

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a relatively conventional steel frame, appropriate for a local builder.

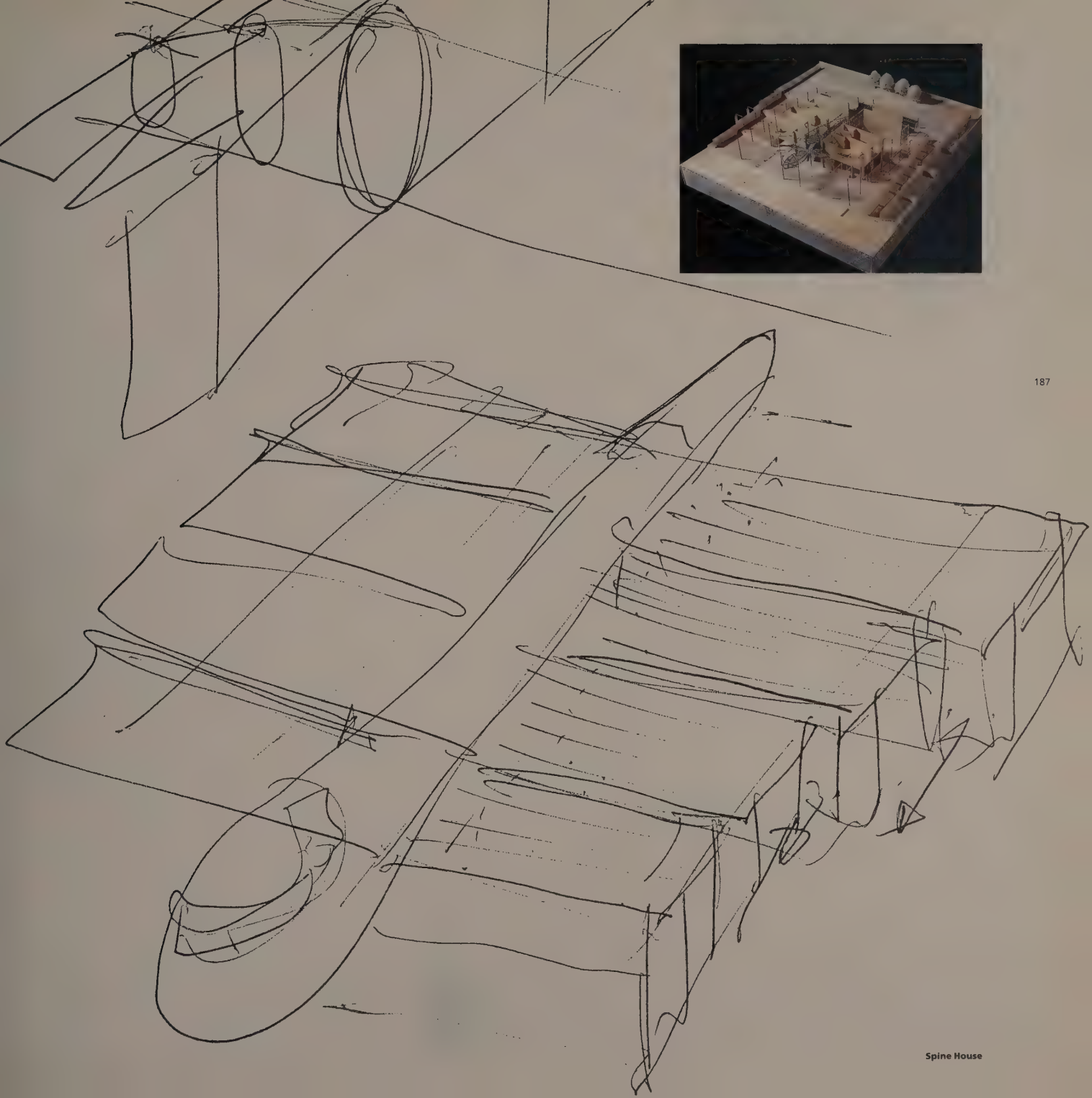
The plan of the house is straightforward if unusual. Bands of accommodation are arranged either side of the spine as the site descends southwards. The roofs and the axis of the spine remain level, but the floor of the house steps down from single-storey to two-storey, and finally double-height living space, as the ground falls away. At the same time, the three principal bands narrow somewhat, half a bay at a time, creating insets with southerly views: however, the roofs are expressed as pure rectangles, and therefore oversail the built volume considerably at the southern end. The line of columns follows the edge of the roof: the effect is to create outdoor 'rooms' which bring landscape and house together.

The hollow timber spine is the visual ordering device for the house. It rises above the roofs to either side, acts as an entrance canopy at the northern end and fattens at the southern end to create an effect not unlike the two-storey nose of a Jumbo Jet: in this case, the equivalent of the upper lounge is a mezzanine study for Frank Blase, opening out onto a balcony. Above this, the nose-cone canopy can flip upwards if required. The aeronautical/marine metaphor is reinforced by the two levels of outriggers on each side bearing horizontal, sliding, fabric sunshades for the living and dining areas.

The spine is raised on pairs of legs giving a full-height space beneath, day-lit from the glazing which traverses the gap to either side of the fuselage. This 'under-spine' space functions as a private art gallery as well as circulation space to the lower level.



The Spine House in construction.



Nick Grimshaw sketch
exploring the proportions of
the spine.

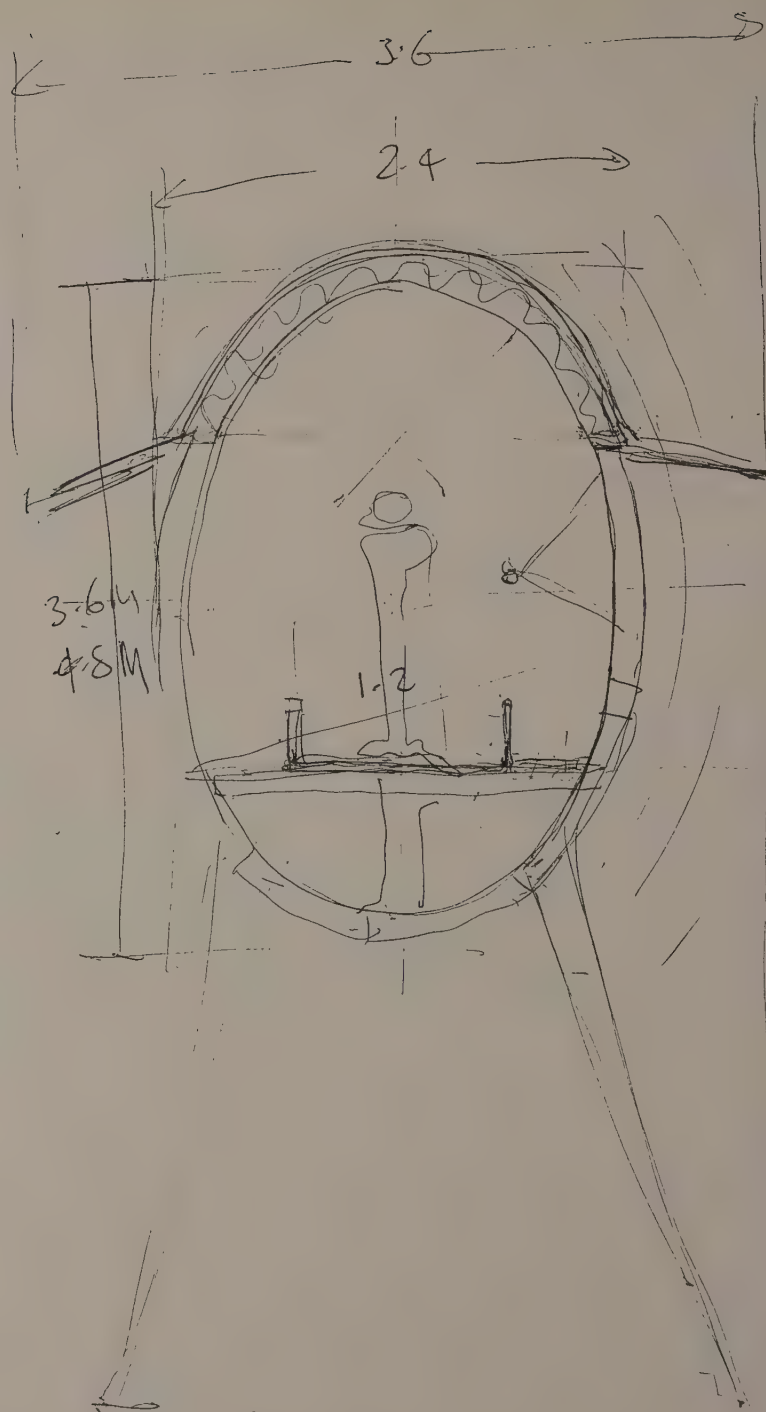
Far right: detail view of the
nose of the spine – a study
opening on to a balcony.

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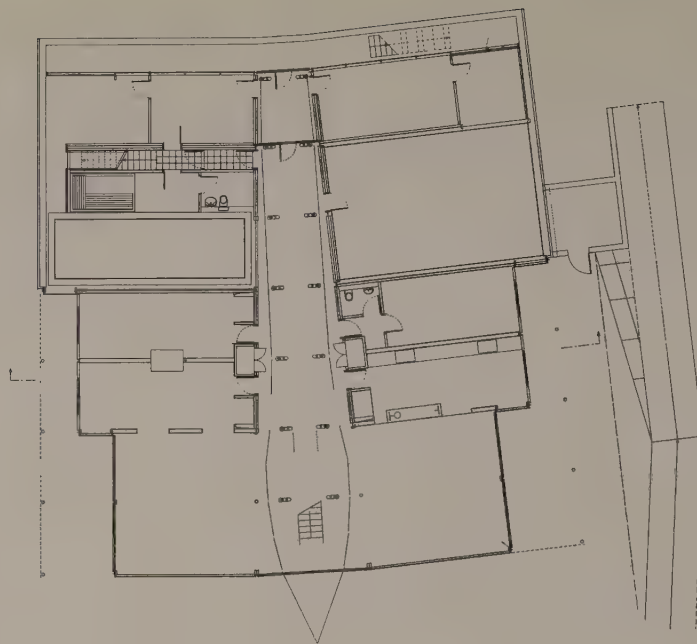
The sequence of spaces is laid out as a logical expression of the relative need for views over the landscape. Garages are subsumed into the building volume either side of the entrance to the north, with plant rooms, storage and utility rooms dug into the ground beneath. The entrance brings you in at the upper level. Next comes the fitness zone – swimming pool to one side, squash court to the other.

Then comes the bedroom zone – the main bedroom with its bathrooms and dressing room to one side, two smaller bedrooms to the other. By now the house has emerged from the slope as a two-storey structure, allowing a guest room, study, gym and kitchen below. Finally, commanding the view down the shallow valley, comes the double-height living/dining area – the dining opening naturally off the kitchen behind, the living area off the study. The two areas flow together beneath the nose of the spine, with stairs leading up into it. The external elevations are expressed in storey-height glazing and opaque insulated panels set within the frame.

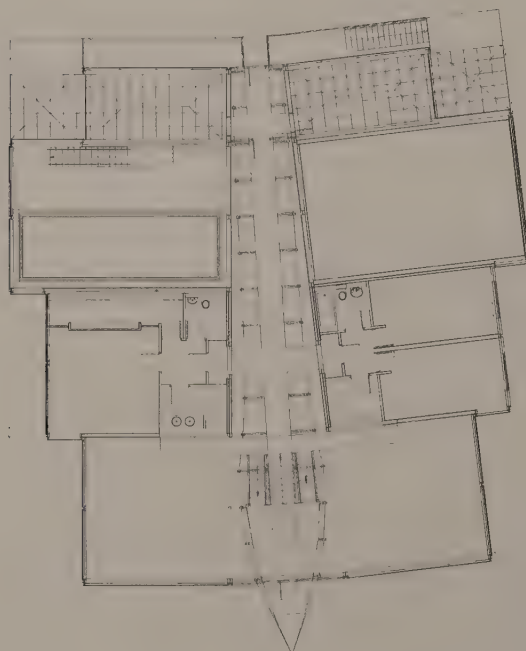
The Spine House subverts the Miesian rectilinear box, and acts as a silent critique of the idea that one response is suitable for all contexts. The box is forced apart by the unexpected intrusion of the timber fuselage, a form suggested by the lie of the land, and which does much more than the name 'spine' suggests. In bisecting the box and making the wings subservient elements, the concept obliges you to consider afresh ideas of the machine aesthetic versus the organic, the right angle versus the curve. All this, intriguingly, takes place in an Arcadian setting, within a plan of strictly classical bilateral symmetry.







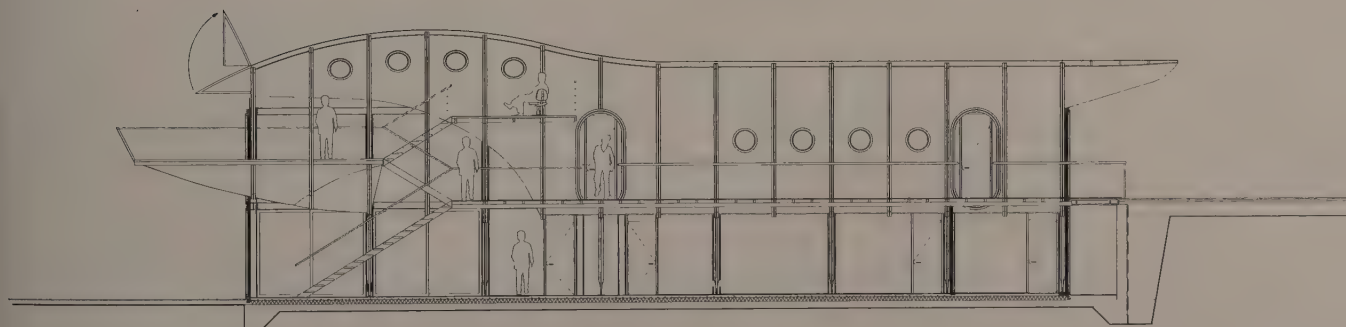
First floor plan.

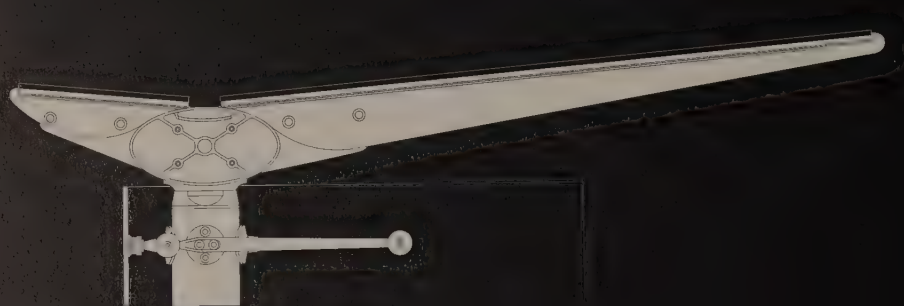


Ground floor plan. The large volumes to the left and right of the entrance are a pool and squash court.

Cross section showing spine
with mezzanine level and
central double-height living
and dining room.

North-south section showing
circulation within the spine.





Industrial Design Projects, 1995–98

I see the process of industrial design as identical to that of architecture. Indeed, the point where a large-scale structure is refined to detail components made by individual companies is industrial design. However, when objects are to be mass-produced – as with signage, a door handle or a street furniture system – then there is a difference. The objects have to be complete within themselves – you are not in charge of the environment where they stand. I often say to people, “Look around you, criticize what you see, make demands of the environment.” If people learn to do that we could see a great improvement in our immediate environment. People would begin to question the visual trash that so often surrounds them. Good industrial design draws the line between fashion and utility. “People will not accept the idea that a bus stop or a street lamp could fall over.” If people applied the same rigorous standards they apply to the objects they use every day to buildings, then architecture also would improve enormously. **NG**



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Cast bus shelter seat.

The 'starter office', a cheap
and flexible furniture system
for fledgeling businesses.

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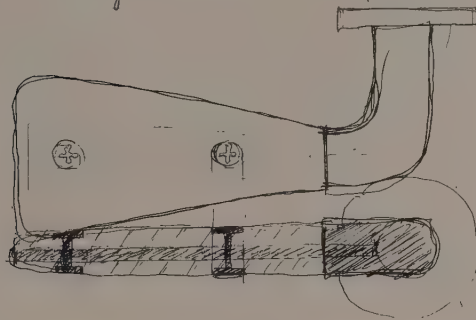
The design of individual components has always been at the heart of the NGP philosophy. In a manner reminiscent of the exponents of the Arts and Crafts movement, the design of a building is considered on both the macro and the micro scales. For instance, the overall effect of the Waterloo International Rail Terminal in London is one thing, but there is a quite separate effect working at the detail level, where precision-made, cast metal components, unique to this project, serve both to connect the glazed elements of the structure and to allow it to flex with the movement of trains.

Industrial design of this kind is intrinsic to almost all NGP building projects, so it has been a natural progression for the practice to expand its expertise by moving into the design of products that are independent of architectural schemes, and for a different breed of client.

The first commission of this sort, in 1990, bridged the disciplines. A long-term buildings client, the office fit-out company Herman Miller, became interested in NGP's concept of a 'starter office', and asked the practice to work up the idea. It was conceived as a cheap, flat-pack system that eschewed the conventional desk by hanging the majority of its components from a vertical, extendible frame. Using it, any fledgeling business could move into a space and be operational very quickly: it also catered for the expanding 'home office' market.

The British recession of the early 1990s meant that the idea never proceeded beyond the prototype stage. However, the thinking came in useful later. The two young industrial designers who had helped to develop

Matt, I'm still keen on the paddle shape (or golf club) I feel it would be nice to handle. Surfaces could be wood or plastic with ss. core.



Nick Grimshaw sketch of an aluminium door handle.

Gravity die cast tool for the handle.

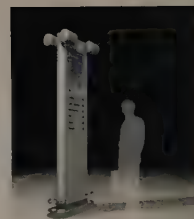


The transport information mast at Paddington Station.



Computer-rendered images showing different permutations of the system.

Far right: extruded profile of cross-section through information mast.



the starter office, Duncan Jackson and Eoin Billings, later returned to form the core of a specific NGP Industrial Design Unit charged with the task both of advising on architectural schemes, and of tackling new stand-alone projects. Located in its own studio with a large degree of independence, the Unit works directly with Nicholas Grimshaw, who has always been deeply involved in the design of components. Grimshaw was personally responsible, for instance, for the FSB doorhandle, originally intended for use at Ludwig Erhard Haus in Berlin, but then put into independent production.

The two disciplines – architecture and industrial design – naturally tend to overlap, as at Paddington Station where an important element of the scheme was to mount a series of electronic information monitors in such a way as to work with, rather than against, the architecture of Brunel and Wyatt. Instead of designing a one-off product, NGP established a relationship with a manufacturer of monitors, Ferrograph, with which it had worked at Manchester Airport. NGP designed for them an aluminium mounting system for the latest generation of ultra-thin, glass plasma screens – devices with the brightness, clarity and robustness lacking in older flat-screen technologies. The system meets IP ratings for protection from water and dust; it was first deployed at Paddington and later at stations and airports elsewhere. However, at Paddington it sits on floor-mounted stanchions that make the installation visually unique.

The Industrial Design Unit is especially adept at developing products involving castings,



Hayes

Ya no
hay nada
que
rascar.

¡NUEVO



Para las picaduras

ALZAR

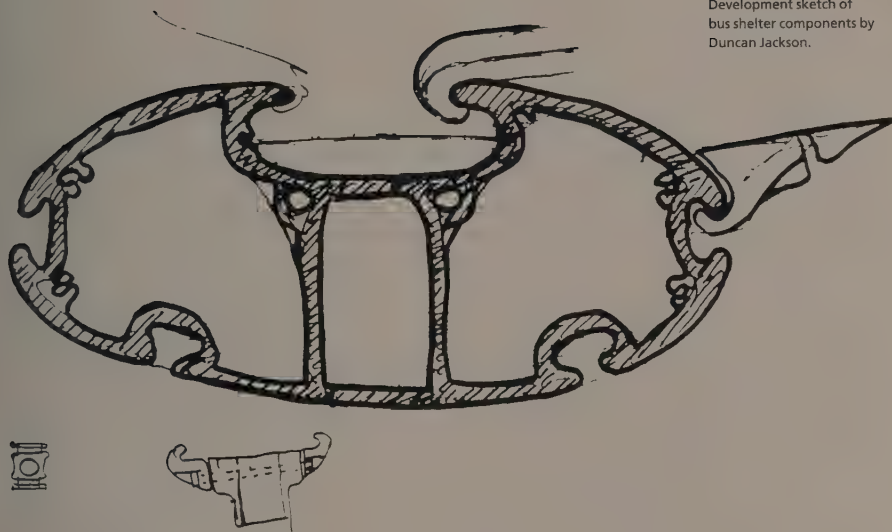
INFORMACIÓN

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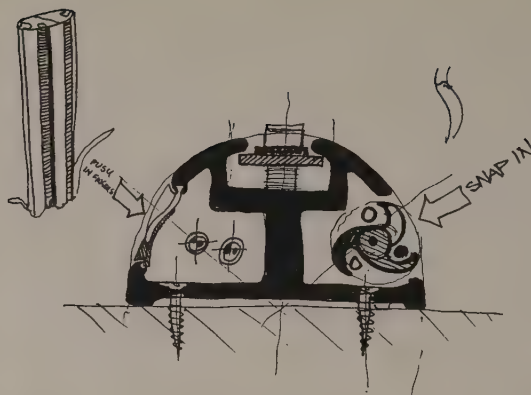
Development sketch of
bus shelter components by
Duncan Jackson.



aluminium extrusions and metal fabrications, and at incorporating laminated (including electronic) glass technology for signage and switching. The component-based products thus developed are highly adaptable. A bus-shelter and street furniture system for the Spanish company Cemusa, for instance – now becoming familiar throughout Spain and elsewhere – proved sufficiently versatile to be made into a complete bus station in Bilbao. If necessary, the bus station can later be dismantled and the parts reused as individual shelters. The system is capable of adapting to the requirements of different municipalities and regions, providing each with a clear visual identity. NGP then went on to explore with Cemusa the possibility of using part of the income from the ubiquitous bus-stop advertising panels to fund small recycling banks for drinks cans, incorporated into the design of the units.

To date, the most complete expression of the NGP industrial design philosophy is the Profile One system for the German signage manufacturer Mabeg. The initial concept was for an 'orientation system' that could be an integral part of a building rather than a last-minute add-on. This Profile One achieves, but it also provides the pieces for partitioning, storage, furniture such as coffee points and reception desks, exhibition displays, even complete subsidiary buildings, such as sales kiosks. It does this by means of a kit of parts based on aluminium extrusions, cast elements and the use of surfaces in materials including glass, timber, laminates, sheet metal and stone. It can be used inside or outside buildings, either freestanding – as with the totemic Information Mast, which can incorporate a bar-like table and footrest – or surface-mounted. Central to all this remains the concept of an ultra-flexible sign matrix, in which glass-mounted signs of all descriptions, from simple labels to large displays, can be incorporated using the same family of parts. The system gives the architect control over what was previously one of the most unforeseen, but most visible, aspects of a building's interior. It succeeds in doing this by providing a very ordered and comprehensible, but highly adaptable, information medium.

Profile One has proved chameleon-like, with an ability to work in very different areas. It was deployed, for instance, as a display mounting medium for 'Fusion', a travelling exhibition of NGP's industrial design work. Profile One tracks are used inside an innovative cabinet based on the aluminium/plywood sandwich flight cases routinely used to transport

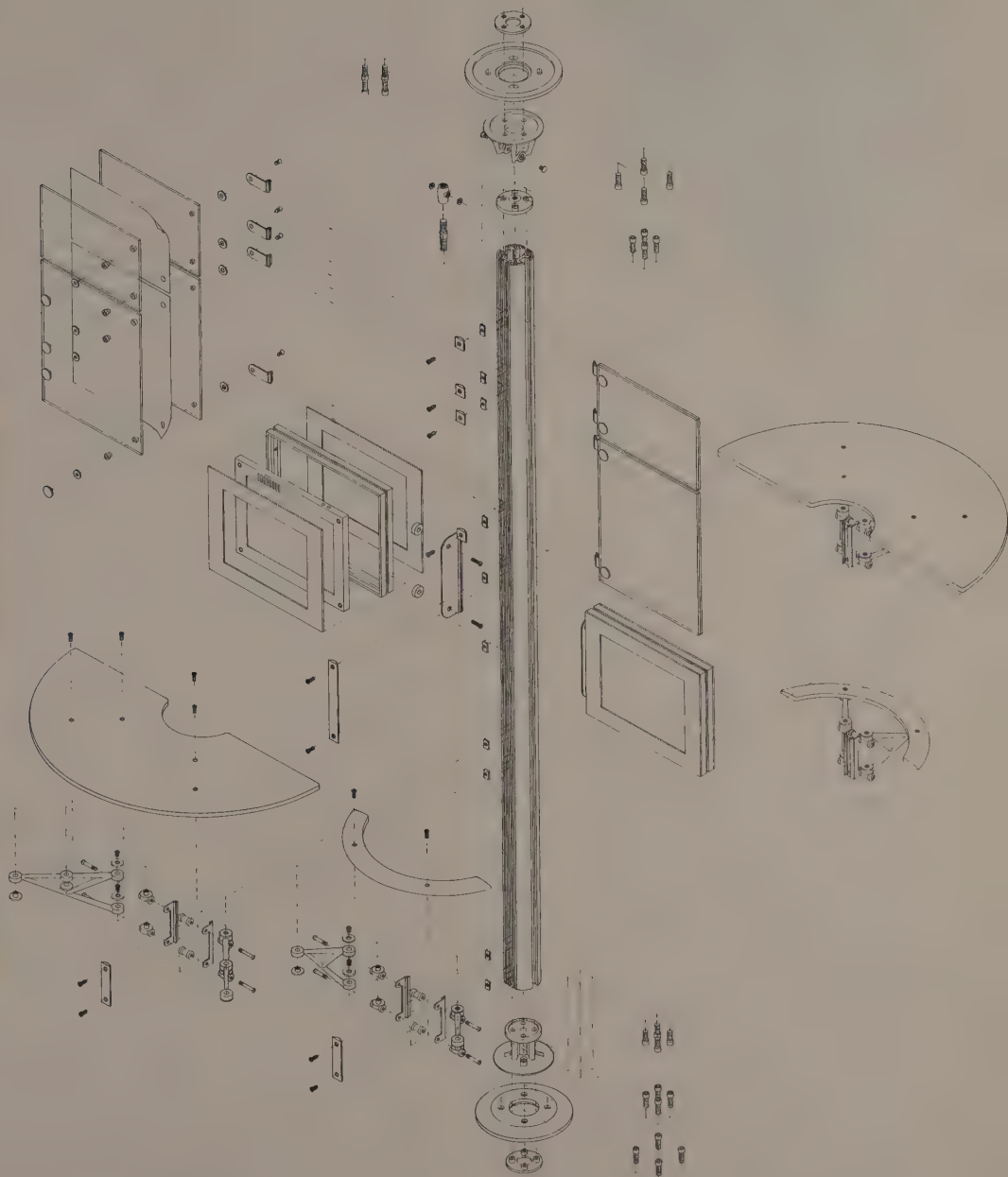


Above left and left: Profile One extrusions.

Above right: sketch by Duncan Jackson showing an early version of the mast system.

Exploded isometric of the
Profile One information mast
kit of parts.

Below: the information mast
in use.





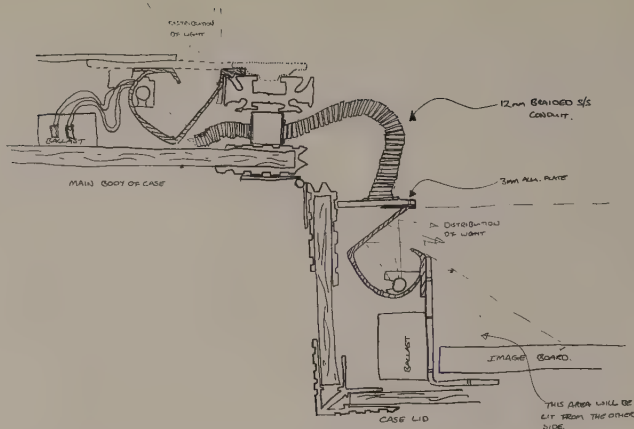
Profile One in use in the reception area of NGP's Conway Street offices.

Right: directional, suspended and door-side Profile One signage systems.



models, electronic equipment and artworks. The cases are lined with an aluminium matrix incorporating lighting – developed with Zumtobel. They are simply placed vertically on arrival at the exhibition site, their castors locked and the doors opened up. The contents are already displayed; it is enough merely to arrange the boxes and plug them into a power source.

Far too high a level of design input went into the Fusion concept for it to remain as a one-off for an NGP exhibition. The logical thing happened: Mabeg, having been so involved in the project, put Fusion into production as Profile One Mobile, a travelling exhibition system. The clarity of the idea – that the packaging for an exhibition can double as the display medium itself – shows a direct line of descent from



Duncan Jackson sketch of a section through the Fusion flight case lighting.

Below and opposite: the Fusion exhibition, using Profile One Mobile, on display in Zürich, and, below, at Wapping Power Station.

the abortive 1990 Herman Miller starter office, where the flat box containing the parts itself became a component of the assembly. Here, however, the subtlety is that the basic shell is derived from an excellent pre-existing product, the flight case.

The circularity of the design-architecture process is satisfying. Buildings – even traditional buildings – are assembled largely from prefabricated components. By designing these pieces, architects can produce a more completely realized building than by merely buying off-the-peg parts. This process, however, can produce objects of a wider application within the built environment, which thus acquire a life of their own. And finally, you get an example of a client for a mass-producible industrial product commissioning a one-off building for its own use: as happened with Mabeg. In an ideal world, such a beneficial design loop would be commonplace. In actuality, it is extremely rare.







**Gresham Street Office, City of London,
1997–2001**

'Few available sites in the City occupy a complete street block, and few sites in the City have a green space in front of them incorporating a wonderful plane tree. We tried to open up the south side of the building to include this green space, which is then echoed in balconies of green planting that step up through the building and break up the barrier between inside and outside. Most City office buildings are very self-contained. This one really opens out to the City, with inspiring views of St Paul's from the upper floors.' **NG**





Previous page
Computer-generated image
of the south elevation
demonstrating why the
project became known as
the 'Tree House'.

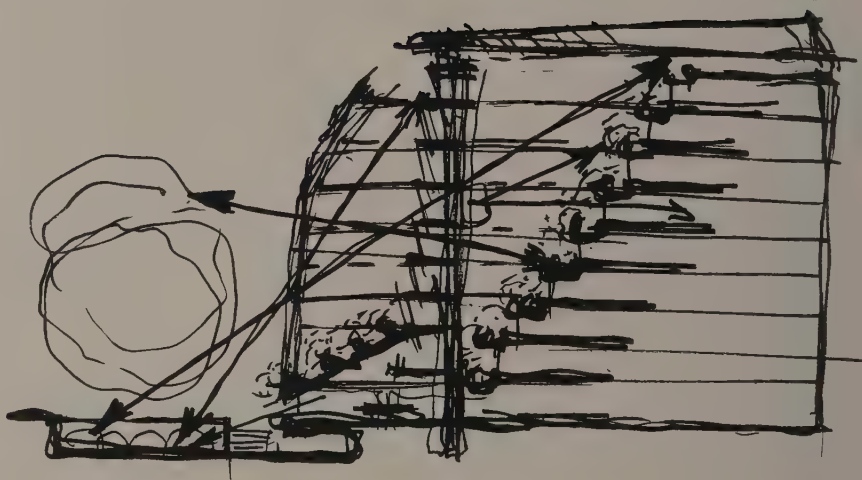
Left: computer rendering of
the west elevation
overlooking the churchyard.

Below: early sketch by Neven
Sidor exploring the use of
stepped terraces within the
atrium.

The City of London is an extraordinary place of sudden juxtapositions between ancient and modern, of medieval street patterns and post-war dual carriageways, and above all, of startling shifts of scale and detail between the small and mostly old, and the large and mostly new. All this – the legacy of trading patterns over centuries, first in goods, then in financial services – takes place in a densely built-up area with very little public open space.

NGP won the commission for its first City of London office block, for the Stanhope Pension Trust, in 1997 thereby exposing the practice to this concentrated and strange urban environment for the first time. The site contains most of the key juxtapositions of the City: it is worth considering these in some detail as the generator of the form of the new building.

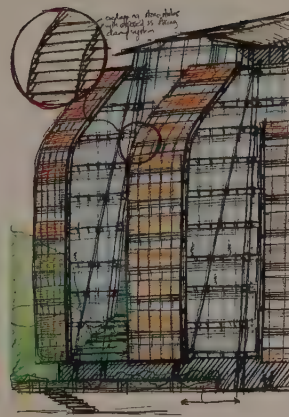
At one side – separating the site from Gresham Street – there is the split-level churchyard of the vanished St John Zachary Church, never rebuilt after the Great Fire of London. The higher part – the original churchyard – boasts two magnificent plane trees, while the sunken brick-walled part is the site of the original church. The garden here, first laid out by wartime fire-watchers in 1941, was professionally landscaped in the post-war years and is known as



Right: Neven Sidor sketch focusing on the overlapped cladding system.

Far right: computer rendering of the cladding system.

Below: section through Neven Sidor's early computer model of the scheme.



Goldsmiths' Gardens – because of the early nineteenth-century, classical-baroque Goldsmiths' Hall opposite. The site – occupied by an outmoded 1957, L-shaped office building – therefore has one vital aspect to the old City. On its other side, however, the scale is blown by the succession of huge office buildings on London Wall. Initially 1960s blocks, successively replaced by a series of 1980s and 1990s buildings, these include a pair by the Richard Rogers Partnership and Foster and Partners; and beyond those, the towers of the Barbican.

The new building is therefore conceived as a mediating device between these two vastly differing faces of the City. The key to the design is its response to the old churchyard of Goldsmiths' Gardens – a rare and welcome public open space. Ten storeys high, 15,600 m² in area and costed at £25 million, the building is U-shaped in plan, the open end of the U – forming the atrium – embracing the gardens and extending them into the heart of the building, horizontally and vertically. Terraces of planting begin outside the building, then pass through its glass wall and rise the full height of the atrium.

Because of the way the building responds to the gardens with its huge tree canopies, the project

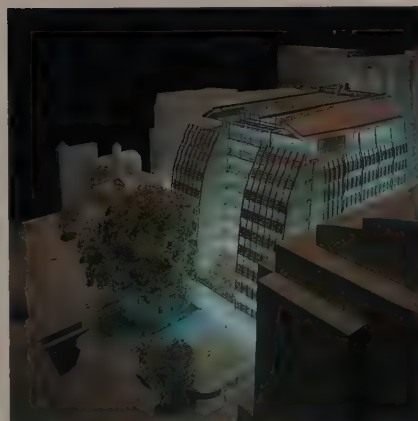
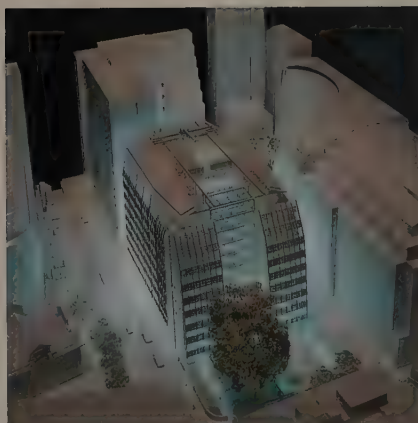


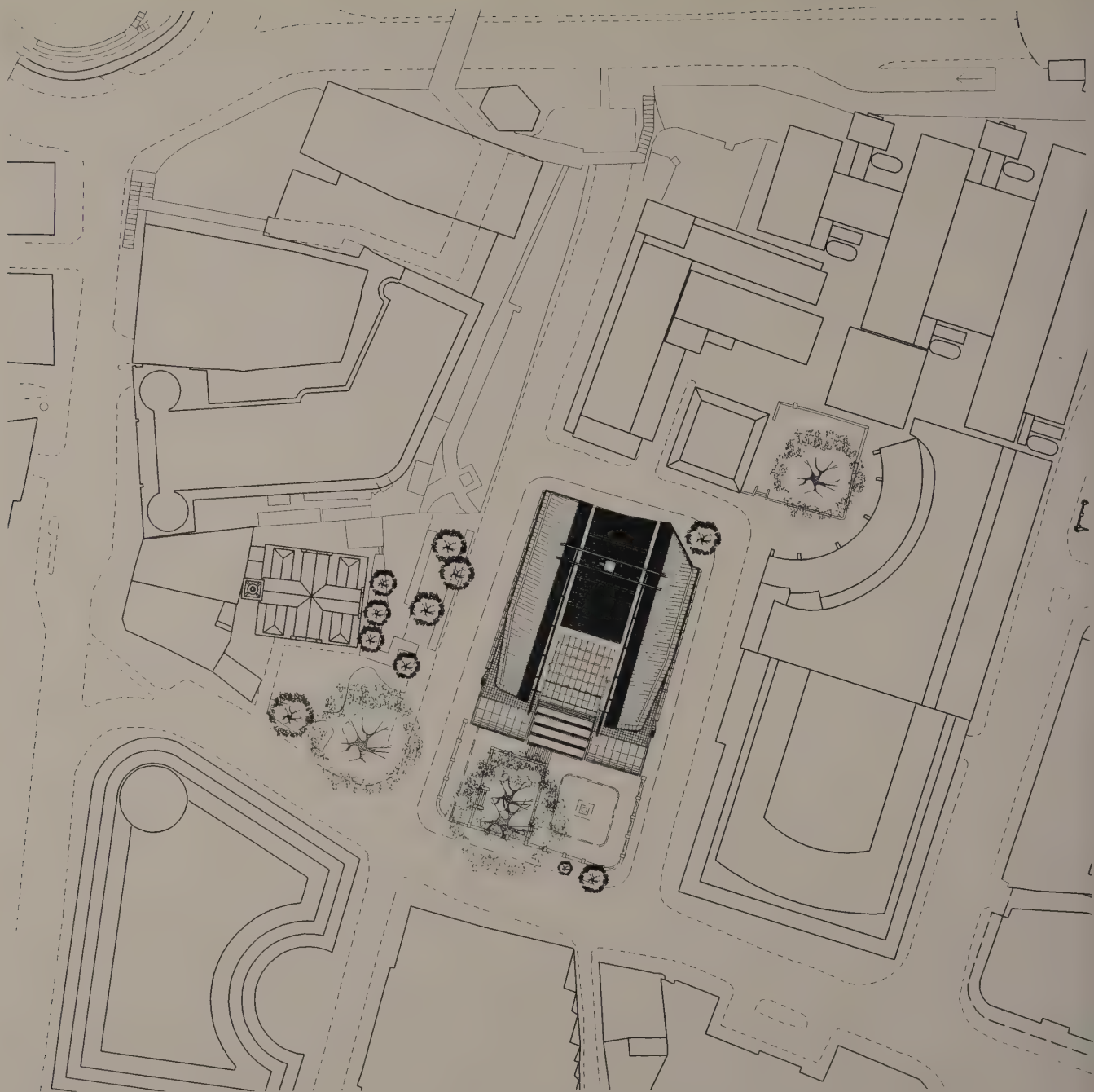
Views of the model showing the immediate context of the scheme.

became known as the 'Tree House'; one of the key points of the design is the way the scenic lifts in the atrium are placed to command views of them. But the scheme also works horizontally with the entrance lobby running from side to side of the building – from street to street – overlooking the gardens. On the level below the lobby, a basement restaurant fronts the gardens across a dividing strip of water. Outwardly-leaning bands of glazing at each landing allow reflection-free views in; so the hanging gardens inside are as publicly visible from Gresham Street as the open gardens are outside.

Other elevational details are equally finely attuned to the importance of the setting. Some solid elements of the facades, for instance, are expressed in relatively small, overlapping panels of green Cumbrian slate supported on stainless-steel fins with cast fixings. As so often with NGP's work, the quality of detailing of the fixings is regarded as supremely important.

The City is sometimes regarded as a difficult area for innovative architects to make headway, and has in the past mostly been the preserve of specialist commercial office designers and space planners. The progress of the 'Tree House' design was not wholly smooth, and – in view of the sensitive site – required sometimes intense negotiations with English Heritage, the conservation watchdog, as the project was refined. It took eighteen months to gain planning approval, which was duly granted early in 1999. This was an important breakthrough for the practice.





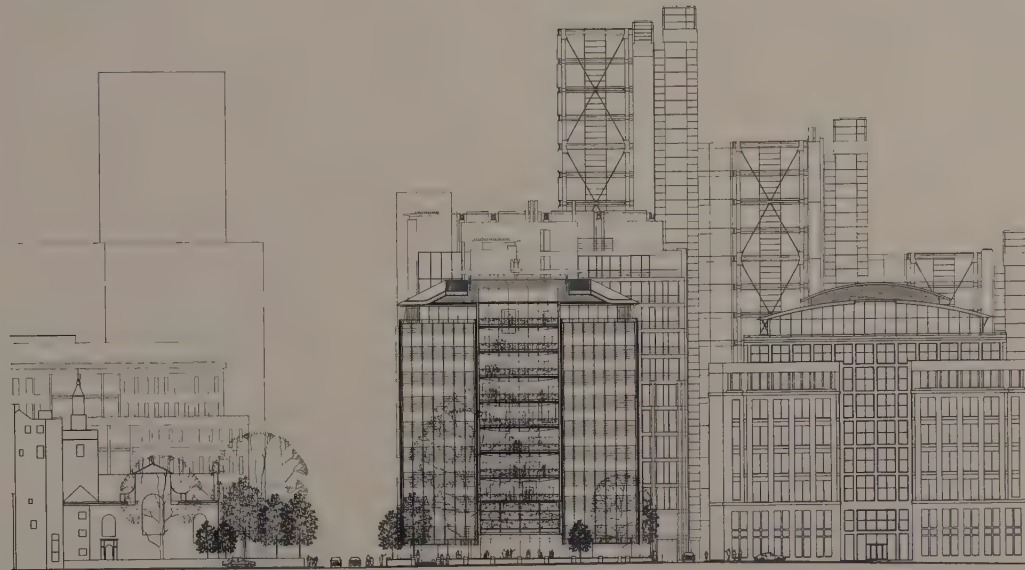
Left: site plan.

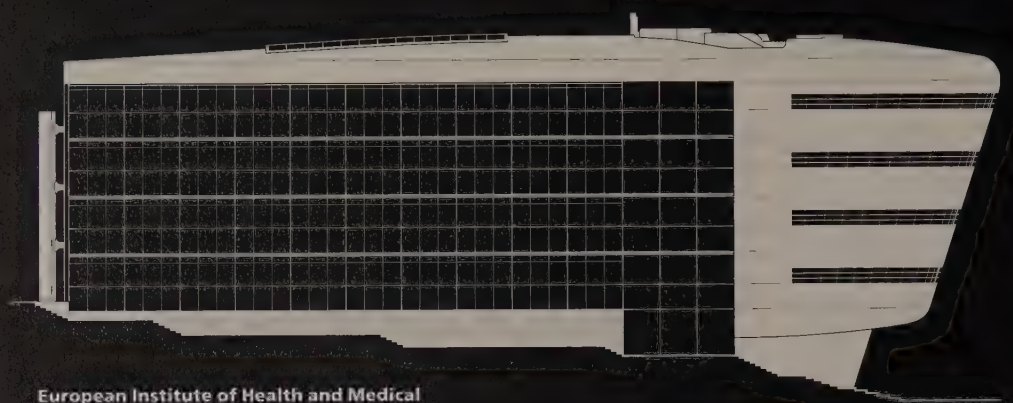


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Long section.

South elevation facing
Goldsmiths' Hall.





**European Institute of Health and Medical
Sciences, Guildford, 1997-99**

'I used to pass this site four times a day on the train to school. At that time Guildford Cathedral was half-built and stood on a round grassy hill. Now this hill is also occupied by Surrey University. Our particular site has commanding views over the town and is located on a steep slope. We saw from the very first that we could take advantage of the hillside to enter the building half way up. With the roof staying at the same level, the lower end of the building could project out towards the town rather like the prow of a great ship. We are hoping for some good exterior lighting here so that the building becomes a beacon at night, marking the point where the town joins the University.' **NG**





Previous page
Detail of the zinc cladding on
the nose of the main building.

Left: the building's distinctive
prow.

Below: a computer model and
drawing of the masterplan
strategy, illustrating the axis
which helped to define the
building form.

The north elevation viewed
from across the lake.

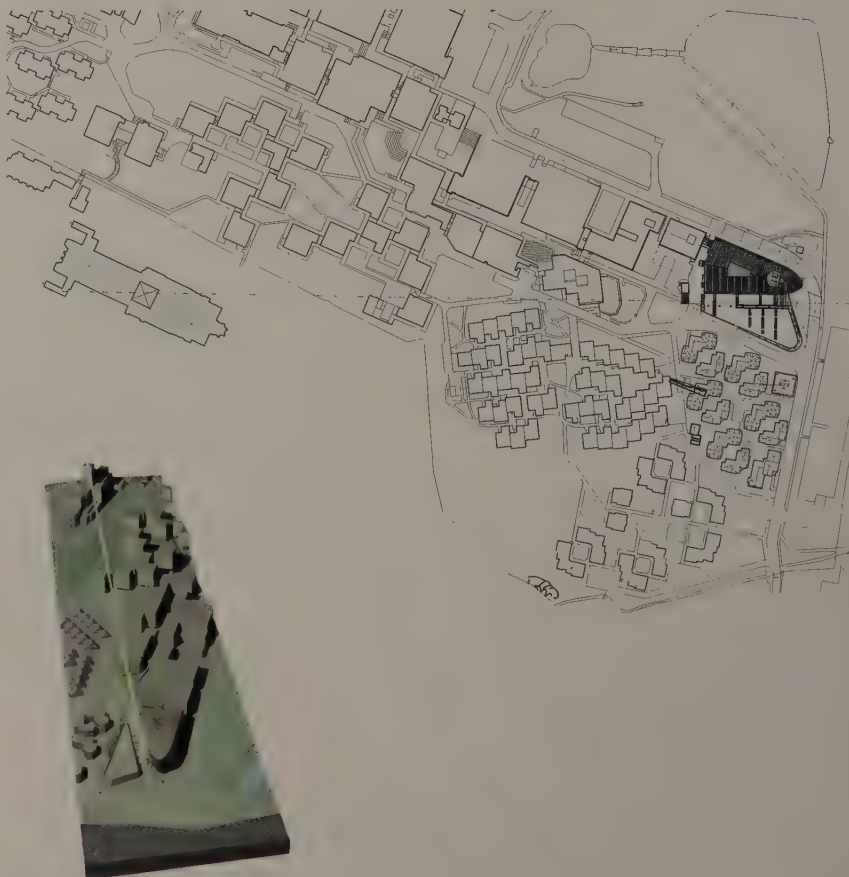
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This is the first university faculty building by NGP, the result of an international competition in 1996. The site was the last remaining substantial piece of development land on this hillside campus below Guildford Cathedral and, moreover, is highly visible from the town centre, the mainline railway and from the A3 London-Portsmouth trunk road. Consequently, it has an important landmark status.

The building is also an important initiative for the university since it amalgamates three previously separate colleges of health care with its existing nursing and midwifery department. Formerly spread across eight centres in southern England, the EIHMS has now moved into the one new building at Surrey University, making it a formidable multi-discipline centre for health care research and education, linked with similar institutes across Europe.

The building is a mix of research laboratories, teaching rooms and faculty offices. The decision was taken to separate the two main elements: laboratories in a curvilinear, low-lying plinth building to the west, linked to teaching and administrative spaces in a five-storey block alongside. Between the two, an axial pedestrian route rises steeply through the campus towards the Cathedral.

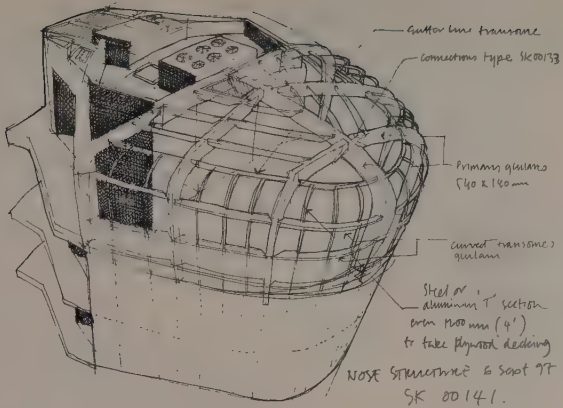
As you approach the EIHMS, its role as public gateway to the university becomes clear; the curving zinc-clad forms of the two architectural elements serving both to mark the entrance and to turn the corner up the hill into the site. The low laboratory building leans inwards, the tall main building outwards, exploiting the drama of its hillside position. Its distinctive prow is based upon the geometry of the







East facade of the smaller laboratory building, with the nose of the main building beyond.



Above right: Kenny Fraser sketch of the nose structure.

Far right: glazed atrium on the south elevation.

hyperbolic paraboloid, allowing bigger lecture and seminar rooms with each successive floor. Behind the prow, the building is clad in glass panels – clear for windows, opaque for spandrels – though the zinc cladding of the nose continues in the curve of the roof. The EIHMS completes a row of existing buildings defining the built boundary of the Stag Hill site – east of this is a park and lake. Its height respects that of its immediate neighbour, the Wolfson building.

To reinforce its function as a new pivot-point of the university, the roof of the plinth building, sunk into the hill at the rear, acts as a public meeting space. Initially paved, it is designed to take a turf roof at a future date if required. Entry to the main building is at either end, where there are very different full-height spaces. At the southern end, a butterfly-plan atrium (known as ‘the gills’) traverses the building behind the nose cone – the plan allowing maximum natural light and ventilation to a necessarily restricted space with its services core. At the northern end, where the fan-shaped plan widens, a much more spacious atrium, in the form of an elongated triangle, allows views right up to the curving, laminated-timber roof structure. Here it feels very much in line with the development of the Western Morning News and RAC with their social, unconventionally planned atria providing generous circulation space. The entrance at the top of the site connects with the central campus walkway and students’ union. Unusually, the building’s plantroom is at ground level rather than in a basement or on the roof. This allows direct truck access, and was made possible by the slope of the site.

The EIHMS is an exercise in creating the maximum

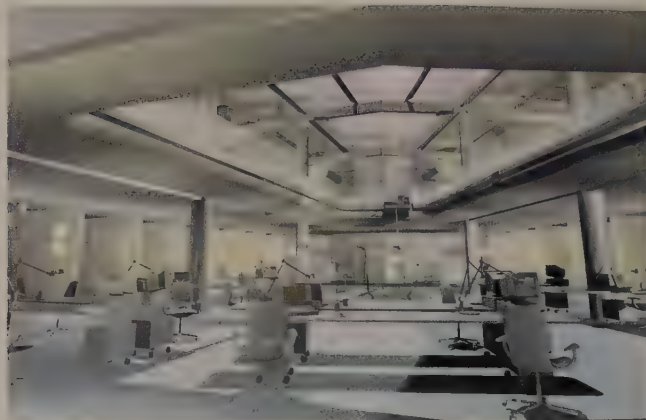


Right: detail of the atrium illustrating the exposed concrete of the construction.

Below: computer rendering of a double height, top-lit workspace.



Slender concrete columns support laminated timber roof beams.

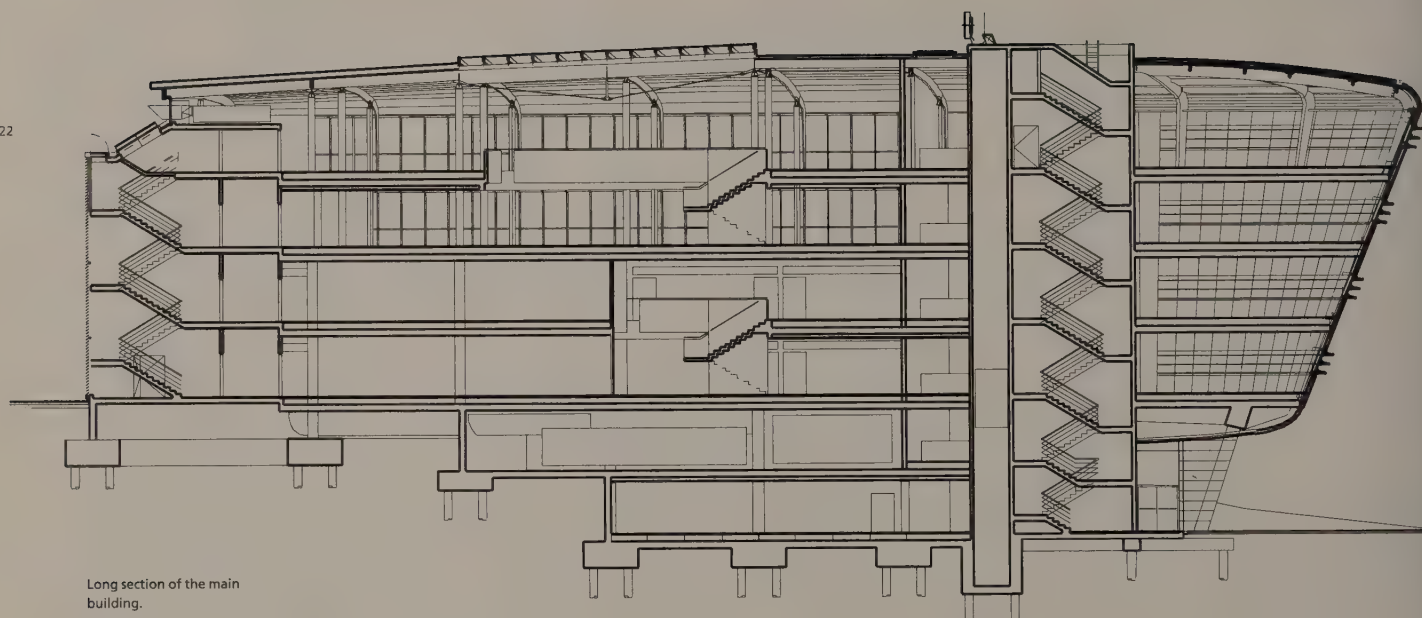


'difference' for the minimum cost, since it had to be built for standard university rates per square metre – rates considerably lower than those of equivalent commercial office buildings. It is largely an in-situ concrete building, which is unusual for the practice. Rather than conceal the construction, the plastic nature of poured concrete is expressed and celebrated in exposed ceilings and sculptural staircases. Components are made to achieve multiple tasks – external maintenance walkways doubling as *brises-soleil*, for instance. Standard low-budget finishes are offset by a carefully chosen selection of more jewel-like elements. The building is naturally ventilated with opening windows.

On the top floor the curving roof structure is achieved with laminated timber beams – though a cluster of slender concrete columns continue up to the atrium roof. The soffit of the roof is expressed in birch ply. These tactile but low-cost materials, coupled with the deployment of a few extravagant elements throughout, serve to raise the perceived quality of the building well above its budget level.

From here – and particularly from the fine rooms in the nose cone – the view across the hilly Surrey townscape and landscape is particularly good. The top floor beneath the roof is also satisfyingly non-institutional in feel. From outside, the building also does a great deal for the money. It completes a previously ragged corner of the campus, makes sheltered outdoor spaces and improved vehicle and pedestrian routes, and acts on a macro level, viewed from considerable distances, as an architectural 'sign' indicating the presence of the university.

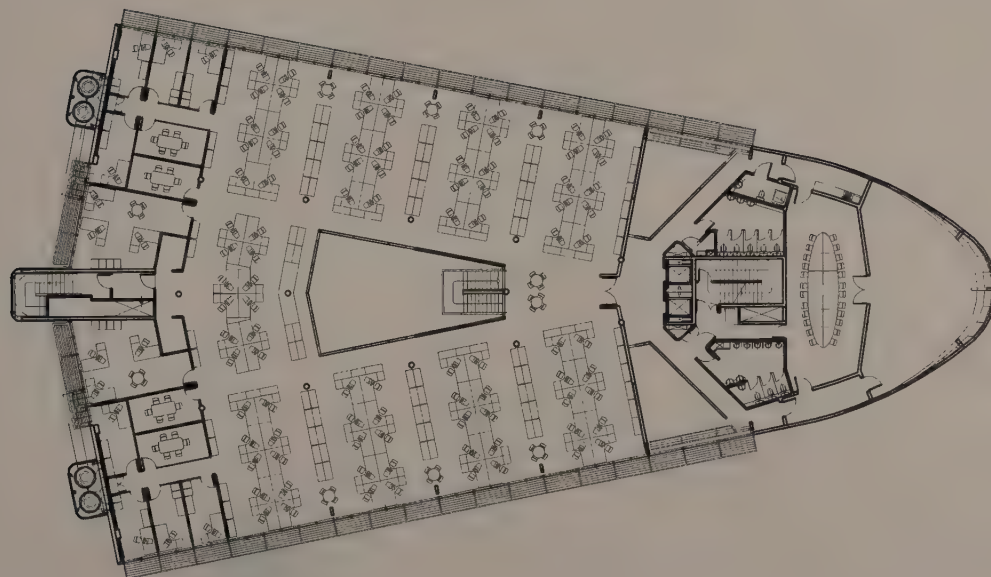




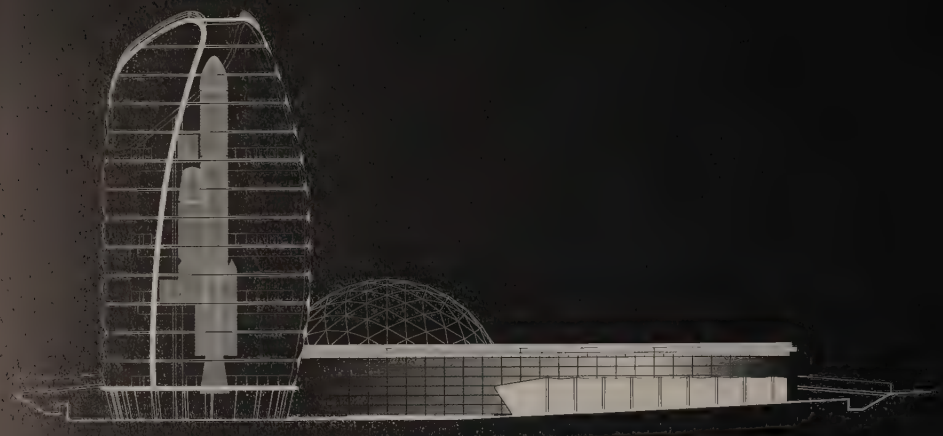
Long section of the main building.



Typical teaching floor plan.

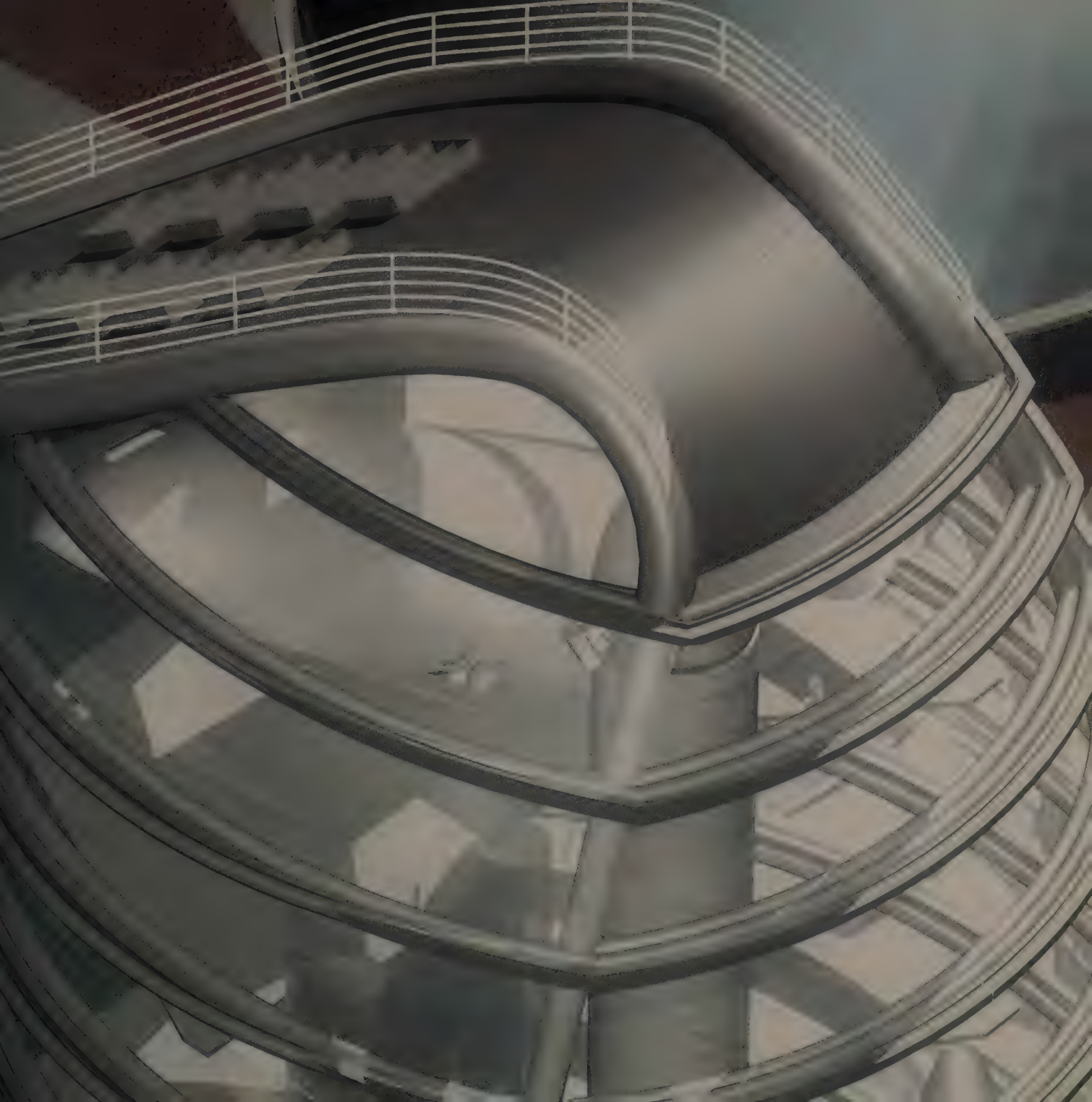


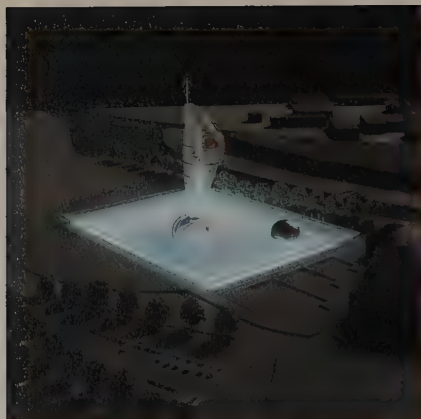
Typical office floor plan.



**National Space Science Centre,
Leicester, 1996–2001**

To all of us who remember Yuri Gagarin's first flight, space has remained an enthralling subject. At Leicester we had the opportunity to reuse a vast underground water tank as a museum for the display of evocative space hardware, and also as a dynamic enclosure incorporating a planetarium and such things as a working cockpit from a Challenger space craft. The tank incorporates a simple dark enclosure. By contrast, the soaring structure wrapping around the rocket display will be an inspiring and intriguing symbol for the town. **NG**





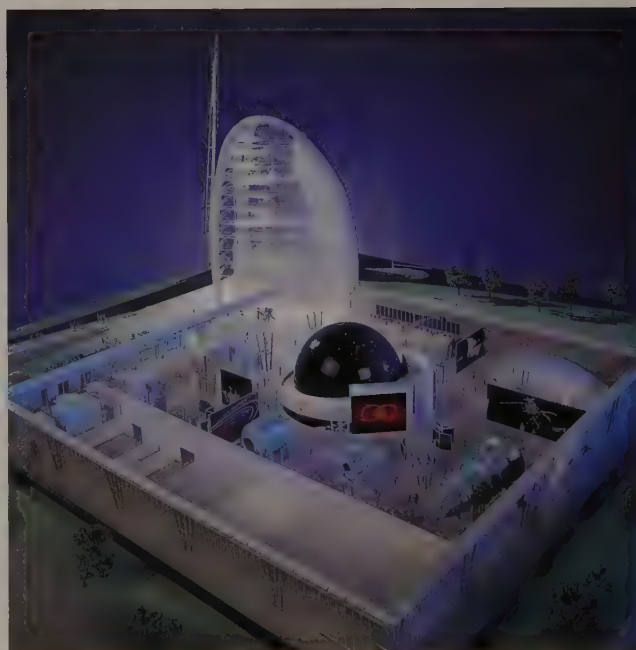
Previous page
Detail of a computer
rendering of the rocket tower.

Left: the competition scheme
reusing the existing
stormwater tank.

Below: design scheme model
with roof removed to show
the exhibition space.

A Centre such as this – presenting space science accessibly for the public, and having a serious research function – has not previously been attempted in the UK as a sole attraction, outside the context of a conventional museum. Sited two and a half miles from Leicester on a former waterworks 'brownfield' site on the north bank of the River Soar, this is an unusual example of industrial reuse. Since the 11-hectare site included a huge oblong stormwater tank, sunk into the ground and roofed over, the original competition-winning idea was to reuse this structure as exhibition space, with a new landscaped roof plane – itself forming a shallow lake – hovering over it. In design development, this scheme proved impractical; the area needed for exhibition space turned out to be less, and the Centre 'shrank' within the curtilage of the reservoir. The new design retains the rectangular tank – without its roof, which is crunched to form ballast – as a separate landscape feature, with the Centre as a new structure, square in plan, standing within it but not touching its brick sides.

The entrance to the main building is marked by the ribcage structure of the 'rocket tower', breaking out of the rectilinear built form at one corner and acting as a landmark visible from the city centre. It is fabricated from welded tubular girders connected at the apex, with an escape stair forming part of the structure. A synclastic (double-curved) secondary structure of hollow steel tubing allows the use of transparent ETFE foil pillows as cladding, rather than glass which weighs ten times as much. Consequently, the tower structure is relatively delicate, which allows its contents – including rockets, missiles and satellites – to be seen all



Right: computer rendering of
the rocket tower in context.

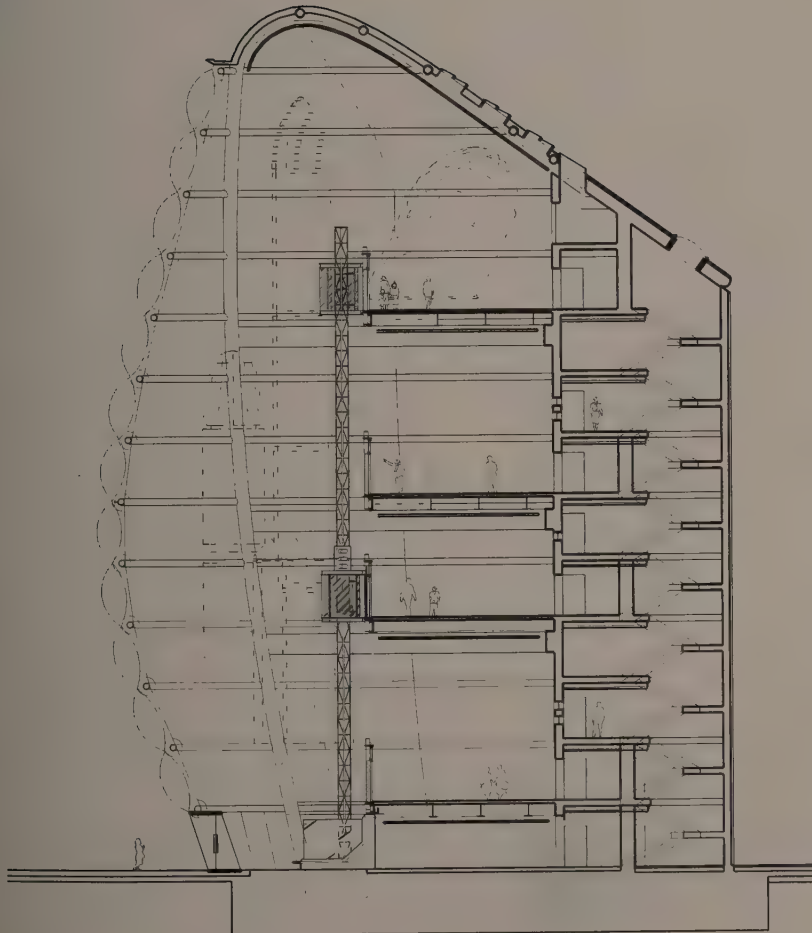
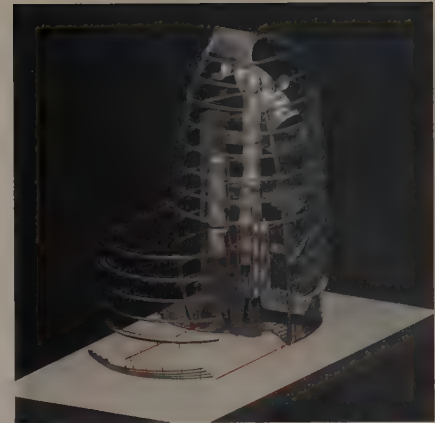




Left: computer rendering of the north elevation. The copper-clad stair enclosure is designed as a torsion tube structure, to resolve the forces generated by the primary legs of the tower.

Right: computer rendering which demonstrates the demountability of the lower 21m of the tower to allow large exhibits to be replaced.

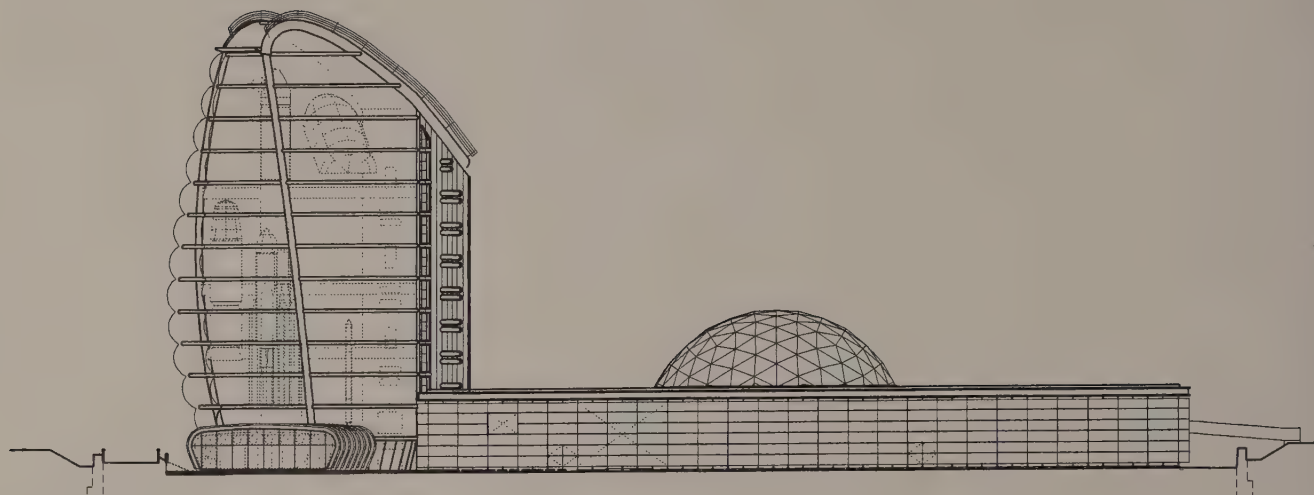
Below: Section through the rocket tower showing the intermediate access decks to allow close-up inspection of the space hardware.



the better from outside. The main building echoes, to some extent, the former reservoir structure in which it sits. A concrete roof, here made of precast components, is supported on a grid of steel columns. Each square section of roof is supported by a column at each corner, so creating column clusters, four by four, at the intersections. Services are integrated into the roof structure on the 'tartan grid' principle, helping the building to keep low. A glass curtain wall, with 'fritted', insulated spandrel panels where views are not required, forms the perimeter envelope.

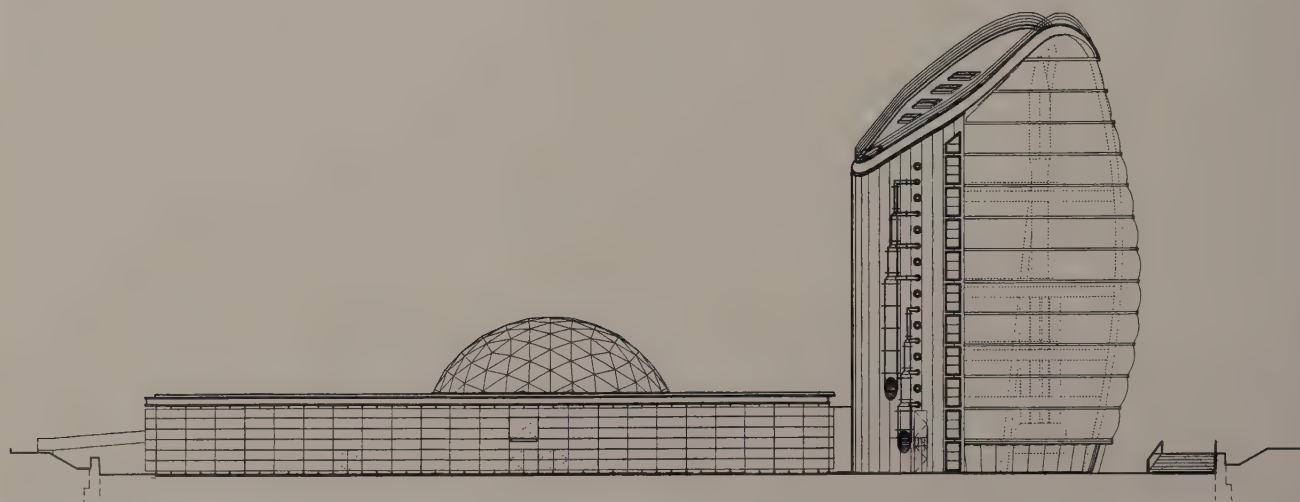
This repetitive structure of the main hall is interrupted at two points: the corner tower and the geodesic structure of the planetarium, which breaks through the flat landscaped roof to form an offset dome. The tower is shield-shaped in elevation and contains raised floors to provide both close-up inspection of the hardware and views out over the city. The 'electric sky' planetarium with its 17.6m diameter, capable of seating 200, will be the largest outside London. It will be equipped to provide depictions of the heavens, but also possesses the electronic means to simulate space and undersea travel.

The stated objective of the NSSC promoters, who are closely linked with the space research department at the University of Leicester, is 'to present the excitement and significance of space and planetary science, astronomy and technology in a way which captures and inspires the public imagination'. Responding to this, the design aesthetic is of the building as alien object – or perhaps as an object in an alien landscape. Its semi-subterranean form is designed to change colour both through its rooftop

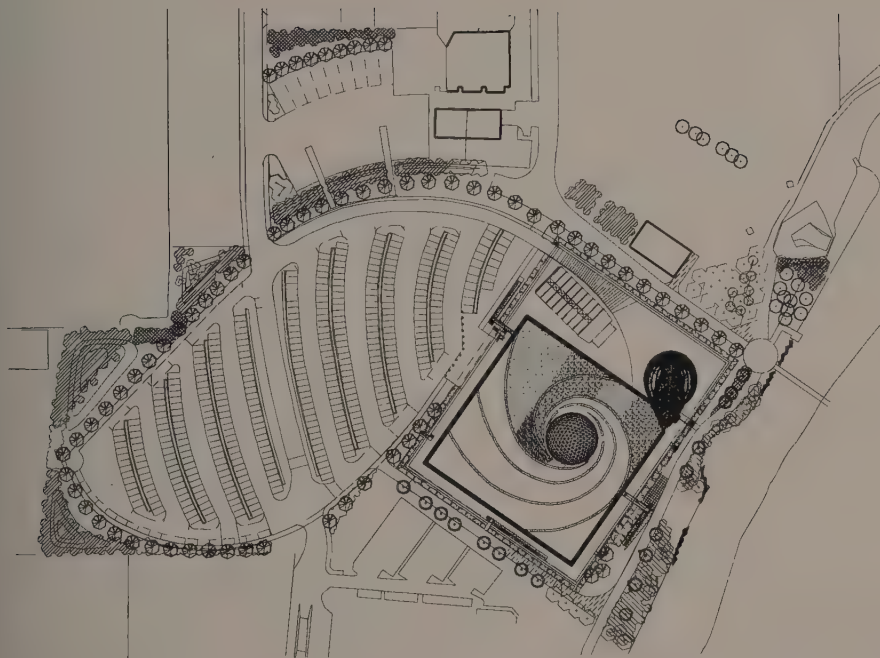


North-west elevation.

South-east elevation.



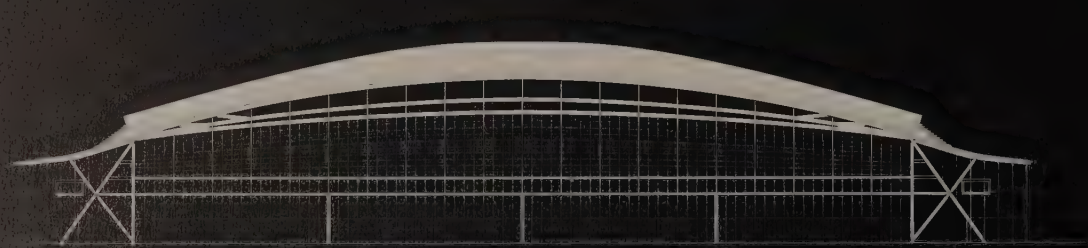
Site plan showing the spiral galaxy concept for the planted roof and landscaped car park.



planting and through a skin including panels and artworks that change appearance with the angle of vision on approach.

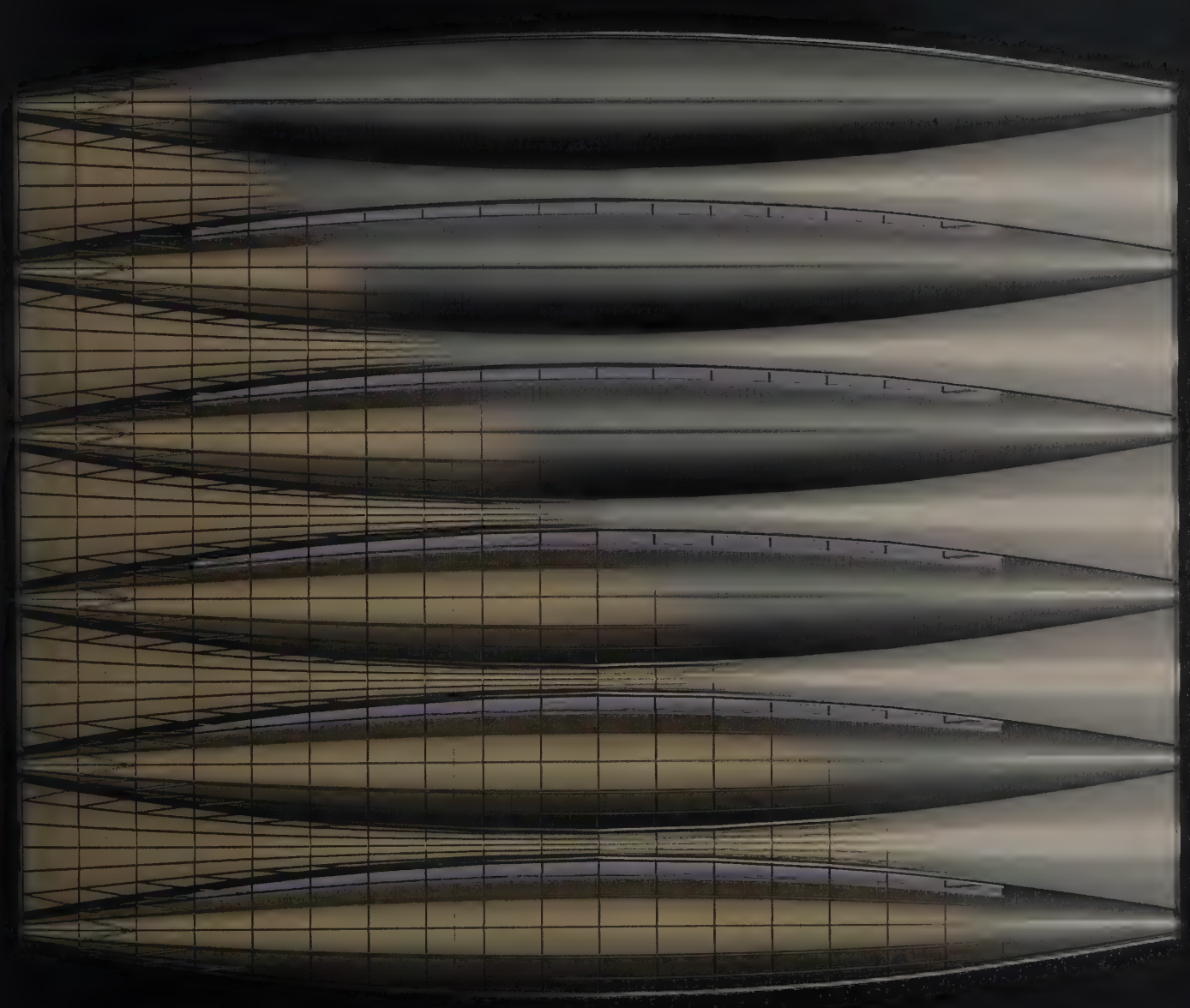
Thus the notion of the 'chameleon skin' – previously mooted in NGP's designs for the V&A Museum – was explored again in this project. Power generated by photovoltaic cells, for instance, was considered to activate a liquid-crystal layer in, what was at first to have been, a glazed tower, turning it from transparent to opaque in strong sunlight. At the time, that technology was still rather too expensive over large areas, so instead the practice turned to another strand of its research: clear foil, as used for the glazing of the Eden Project, in conjunction with opaque materials.

The tower and roof also play a part in the NSSC's total energy strategy, which makes full use of the high thermal mass of the roof and rubble foundations. The roof works as a heat sink, the tower as a rapid-response regulator through controlled, passive solar gain and ventilation, while the underground mass acts as a year-round thermal buffer. These techniques, while useful on Earth as a means to reduce heating and cooling costs, will also be vital in future space settlements as proposed by NASA; so, to an extent, the NSSC is a research tool. As with certain other NGP buildings – the RAC Regional Headquarters springs to mind – the landmark status of the NSSC is important. Leicester is a city dotted with interesting modern buildings, many concerned with technology, from Stirling and Gowan's Engineering Building at the University, onwards. The cocoon-like tower of the NSSC takes its place in this unusual cityscape as a contribution to the visual conversation.



Frankfurt Messehalle, Frankfurt, 1999–2001

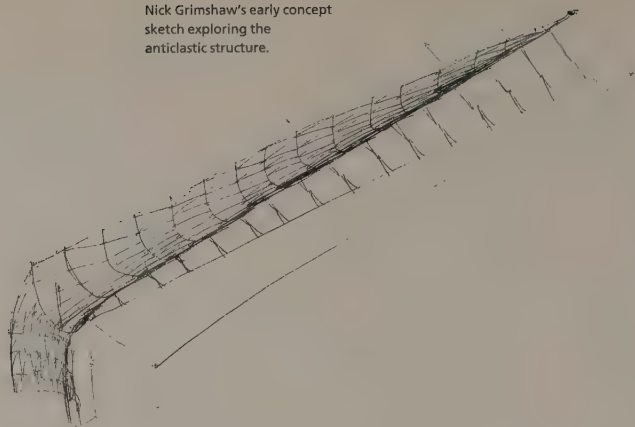
It took us some time to come to terms with the size of this structure. It could be the widest-spanning structure and the largest column-free space in Europe when completed. A building this size must have presence; it must be inspiring even when filled with hundreds of exhibition stands all of which are different. We opted for a roof which was low at the sides but which soared across the centre of the space. A folded structure, rich in detail, in which the impressive arches and the tensile roof structure would be clearly understood. We hope the structure will be inspiring and that, however grand the events to be held there, people will leave remembering the building. **NG**



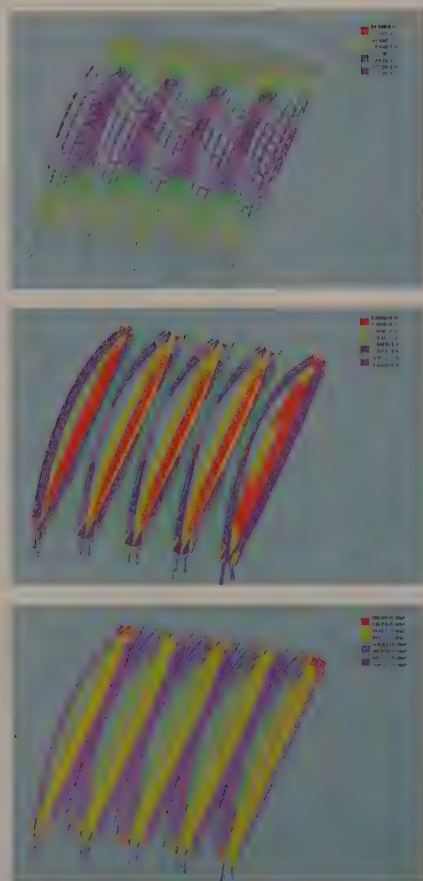
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Computer rendering of the roof plan illustrating its structure and the north-facing rooflights.

Nick Grimshaw's early concept sketch exploring the anticlastic structure.



Below: (Ove Arup + Partners) computer-generated studies of the structural behaviour of the roof.



Frankfurt is famous for finance and for its exhibition centre – the Messe. Its trade fair area, unusually for such places, is central rather than being pushed to the outskirts, which – coupled with its high-level pedestrian access route – gives it a density and feel akin to a complex air terminal. For NGP, with its long experience in clear-span spaces, this presented a challenge to relish: how to reinvent the big shed – both to create a central landmark structure for the Fair and the city, and to take the practice's expertise in such structures an important step forward?

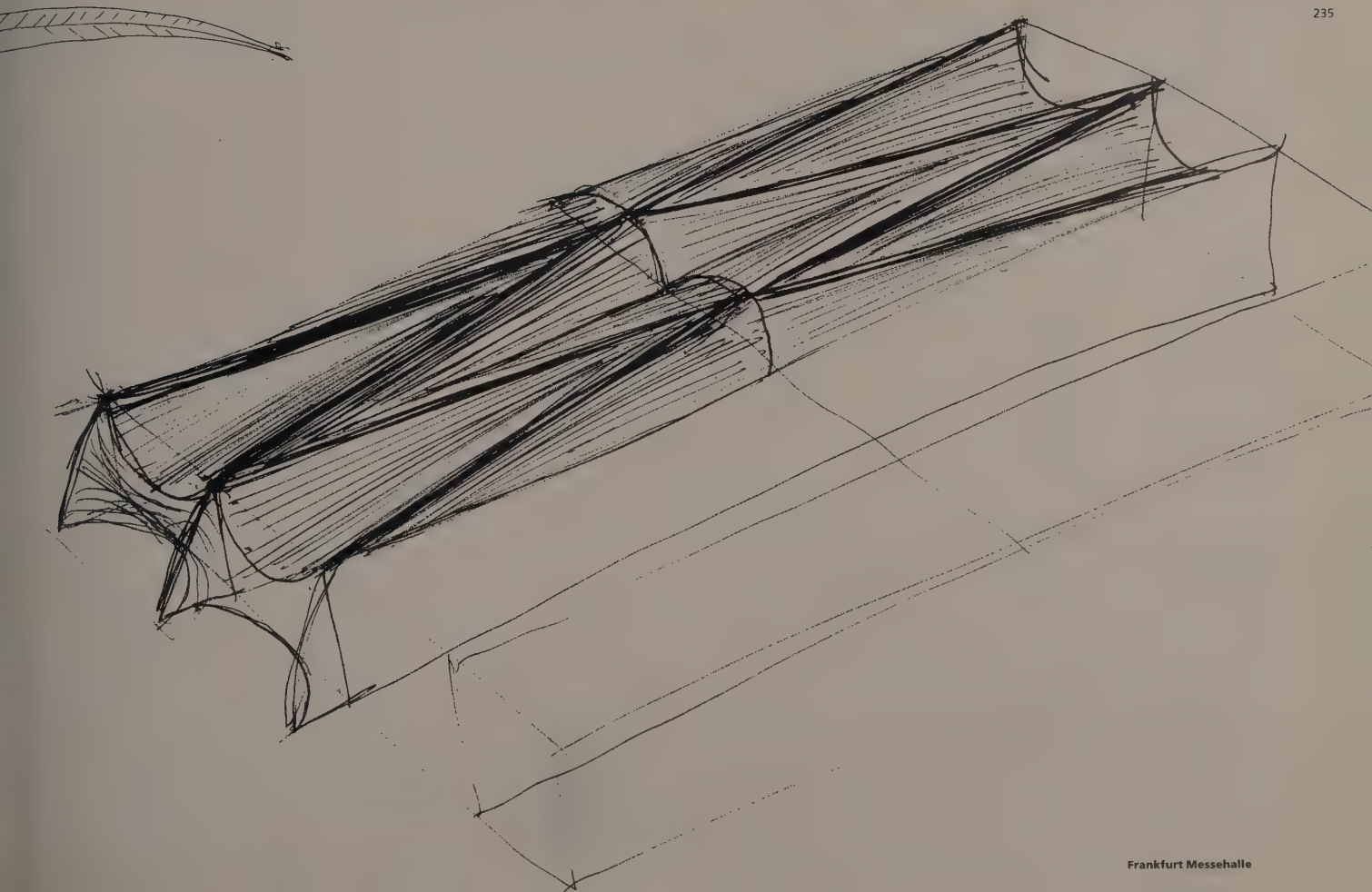
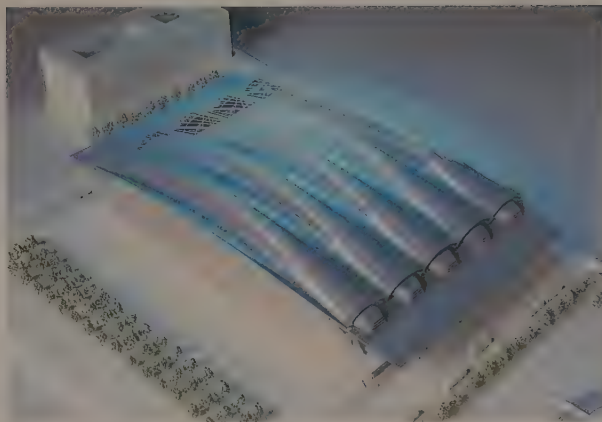
The competition-winning solution is conceived as a seamless fusion of architecture and engineering, in which function and aesthetics are equally inseparable. The multi-disciplinary design process, comprising architects and engineers from the U.K. and Germany, was rigorous: once agreed, the design was refined down to its essentials so as to be strikingly efficient and cost-effective. Not that this is any ordinary low-cost big shed, despite its prosaic title of 'Hall 3A'. With its 160m span, and covering a two-storey exhibition area totalling 40,000m² plus two flanking blocks of four-storey foyer spaces, it cost £80 million and had to be built in eighteen months in time for the 2001 German Motor Show. It is on an heroic size and scale.

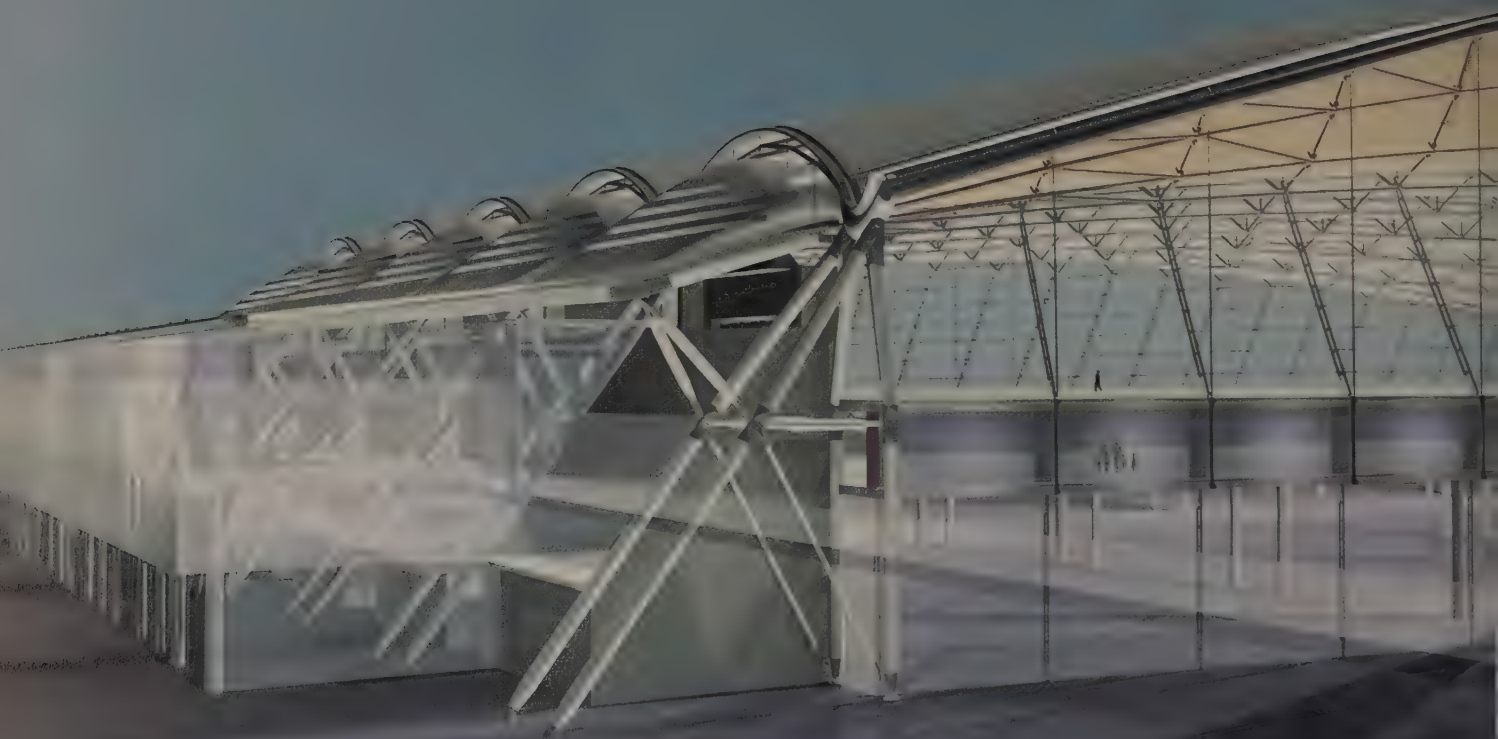
Often the simplest gestures – seemingly effortless, but requiring great clarity of thought – are what convince competition judges. Such was the case here. The bold idea is to arch the great roof along the length of the building rather than across its width, as would be the conventional solution. Arriving at the most appropriate form of truss to achieve these huge shallow arches then led to the 'linked canoe'

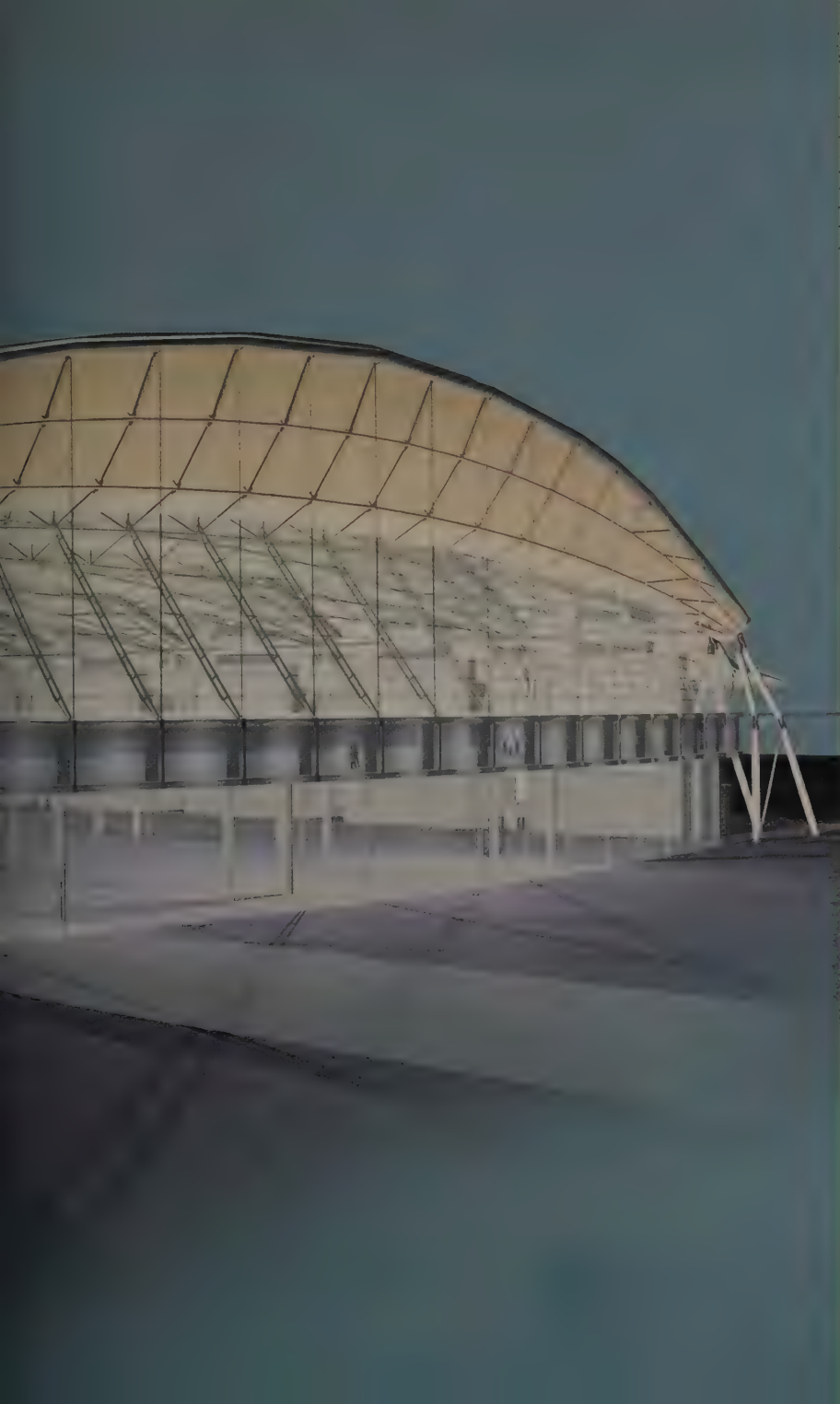


Right: view of the
competition-winning model.

Below: Nick Grimshaw
concept sketch and sketch of a
possible roof form.

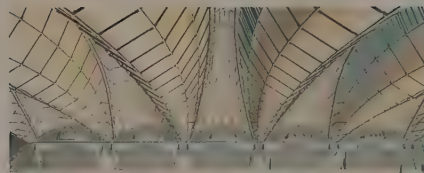






Left: computer rendering of the exterior seen from the 'Agora'.

Below: computer rendering of the interior.



structural solution, forming a net of tubular structural members that perform much the same task as a giant folded plate structure. Clerestory glazing defines the edges of each truss and brings daylight into the deep plan. Further glazing is then introduced around air extract modules at the splayed ends of the trusses.

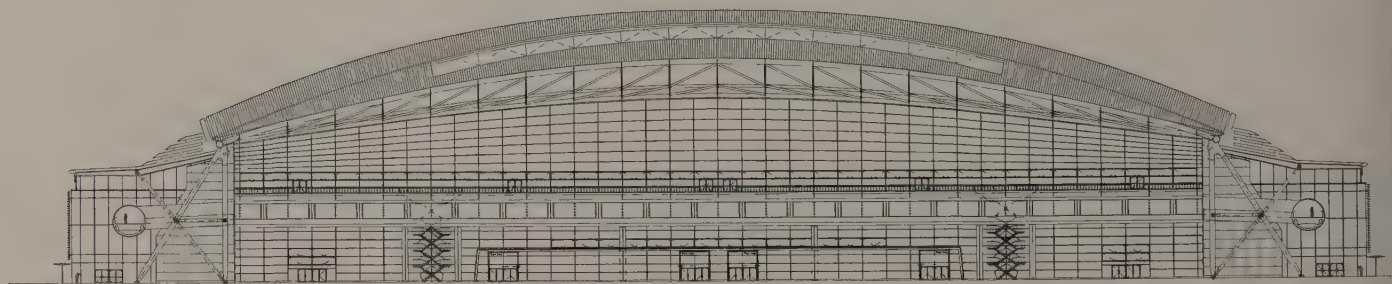
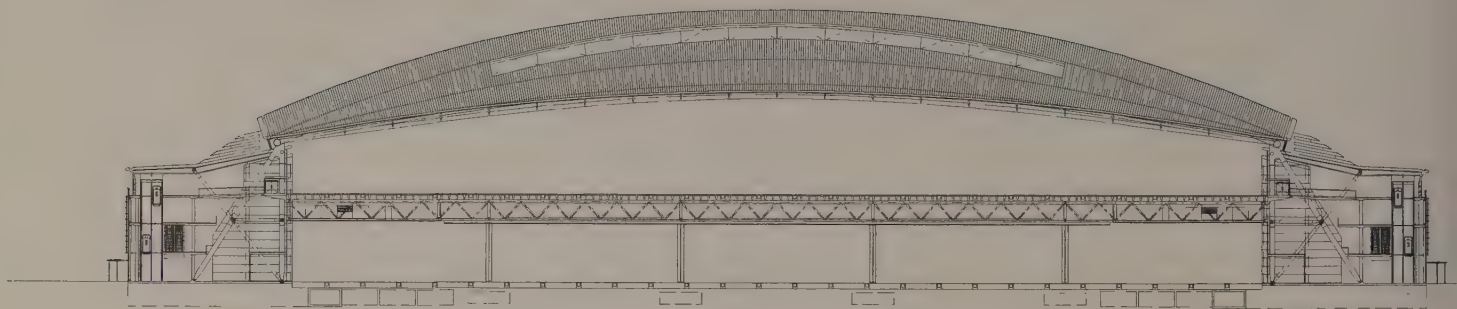
The building serves to complete the perimeter of a large urban square, known as the 'Agora', at the centre of the exhibition quarter. Facing north across this square, it is able to present a highly dramatic glazed elevation running the full length of the building and clearly displaying its structure.

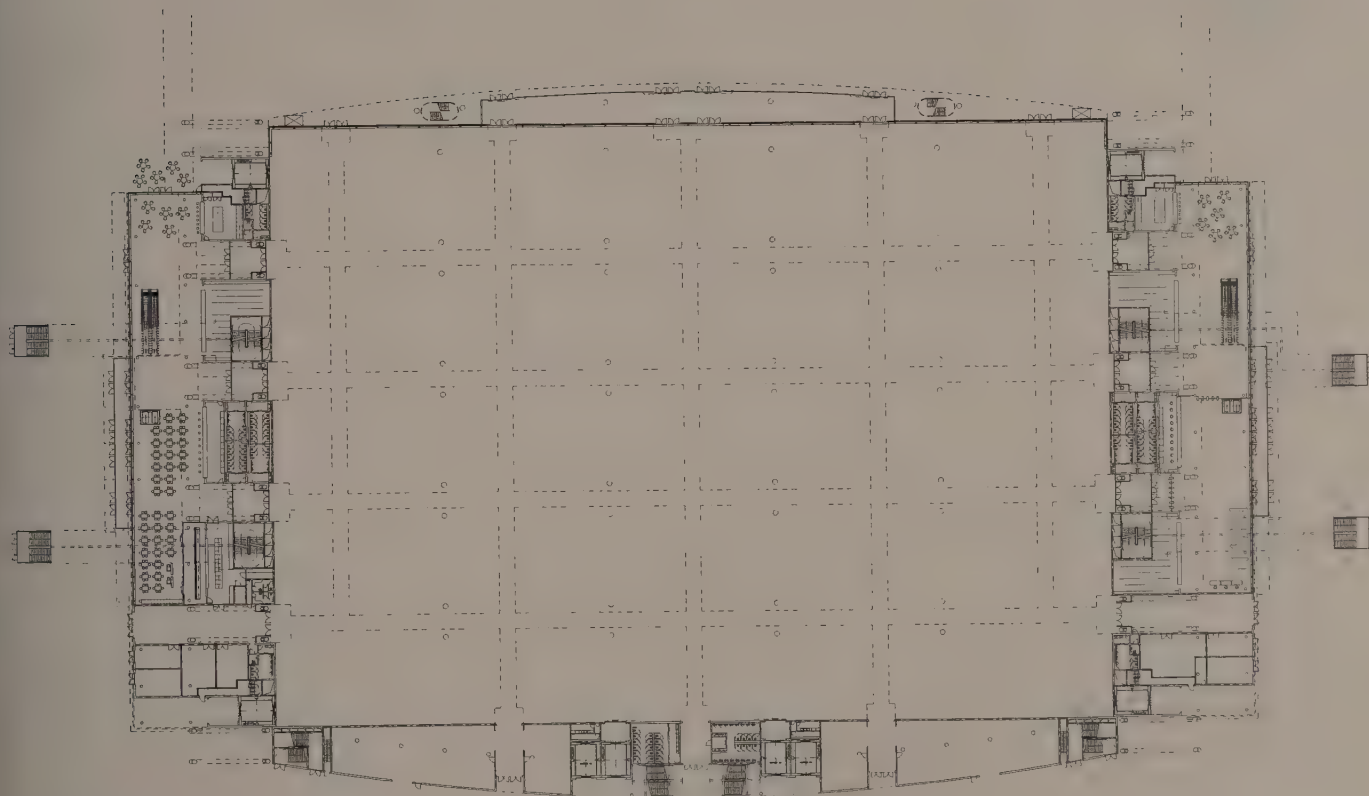
The great roof is kept clear of plant and services ducts, all of which are instead incorporated into the double-deck structure forming the separation between upper and lower exhibition halls. This storey-height void also absorbs the Fair's high-level pedestrian route – the 'Via Mobile' – so creating a busy loggia overlooking the square.

The effect of the roof structure is to create a twisting geometry which has to be followed by the weathering roof surface (in zip-up seamed aluminium) and its inner lining of stressed timber panels. But because each twisting plane repeats, only sixty different panel types are required for the whole vast roof area.

As an urbanizing object on a grand scale, the new hall helps to redefine the notion of the public building. Inside, the upper floor beneath its virtuoso roof promises to be an architectural experience of extraordinary impact.

Long section.

North elevation facing the
'Agora'.



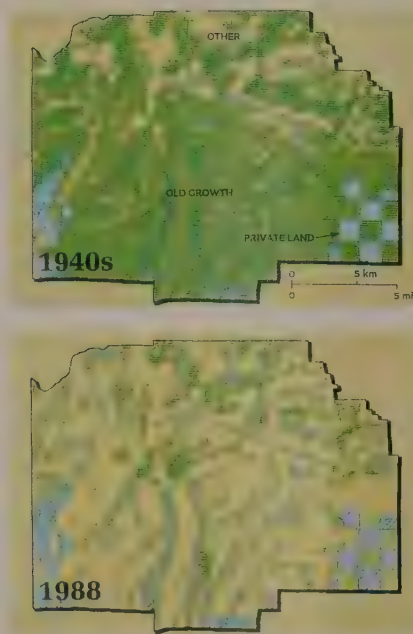
Plan of lower level hall.

EQUILIBRIUM

Architecture and the Environment

Nicholas Grimshaw, April 1999

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Deforestation on the West coast of the USA.

I would like to start by saying that, as we approach the end of the second millennium, it seems we are beginning, at last, to treat our globe with the respect it deserves. The two recent conferences on the global environment in Rio, and also the one at Kobe, dealt with a large number of environmental issues on an international scale. I would like to feel we are entering the third millennium with a much greater degree of global responsibility. The question I would like to address in this lecture is what role can we, as architects, play in this future world?

I believe ours is an important role, and this lecture contains some of my own thoughts on aspects of global responsibility which are part of NGP's philosophy for the future. The environmental issues I will be talking about are positive ones, but it is interesting that images to illustrate these have proved fairly difficult to find. We are used to being bludgeoned with negative images, such as the burning of oil wells or a landscape destroyed by mining.

I would first like to mention that, during this lecture, you will see a series of some eighty pictures of myself on my three-kilometre walk to work through Regent's Park, which run in parallel with the main slide show. The point of showing these is that I have calculated that if I did the same journey by car, I would need to plant 300 good-sized trees to counteract the pollution caused. In my working life I therefore feel that I am making my one small contribution to helping the global environment every day!

The positive themes I would like to cover in this lecture are outlined as follows. The first is the important issue of the mapping and management of buildings and the environment – the greater our knowledge, the greater our

chance of doing something effective with design.

The second theme is flexibility – the more responsive our buildings are, the more we can get out of them in the long-term. My third theme is communications – if we can communicate effectively with each other, it lessens the need to move around, which has wide implications for the development of cities and, indeed, whole countries. The fourth theme is the city-dweller's relationship with nature – how can we enjoy the wonders of the natural world without also destroying it? The fifth theme is the decline of manufacturing (which has been the very basis of the developed world), and the growth of knowledge-based industries, such as design. My sixth and final theme touches upon one of the most compelling issues of the age – how the so-called developed nations can share their resources and expertise with underdeveloped nations. In my view, this has to be the route to a more peaceful world.

And so to my first theme, the mapping and managing of buildings and our environment. The pollution of rivers in Europe has been a very big issue for some time, and now considerable progress is being made by international treaties to clean them up. In the lower reaches of the Thames, for instance, it is now possible to catch fish.

Forests are now being managed. The introduction of practices such as replanting, checking growth and the clearing of crowded trees means that it is no longer a crime for architects to specify hardwood in their buildings. Aluminium is being recycled using only 20 per cent of the energy needed for its original smelting. I have read that by the year 2020 there may no longer be a need to mine aluminium, because there will be enough circulating in the world to be continuously recycled.

Car tyres are being recycled for various purposes – to provide heat and even as components of a basic form of shelter. Many metals are now being compressed and kept for recycling. Nylon clothing is being recycled to make tennis balls.

Air pollution is being addressed – the car industry, including huge companies like Honda, is researching the use of solar cells to power their vehicles. I particularly like the message conveyed by the image of camels carrying solar cells to a remote village.

Nowadays, nearly 80 per cent of our newspapers are made from recycled paper. An interesting issue also is the effect of the compact disk on information storage. Vast amounts of paper are now being saved by storing information digitally and thereby reducing the scale of tree destruction.

This kind of monitoring and analysis of what is going on in the environment is extremely important. I have cited only a few small examples, but the important thing is that global awareness is increasing exponentially due to present-day communications. So the sort of mapping that you can see in this image of one small area of America is now taking place globally. The result is that we know what is happening in the world and can therefore take responsibility for it; and we can change it.

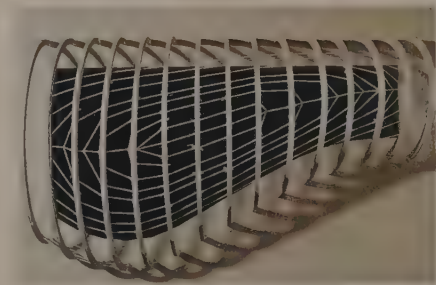
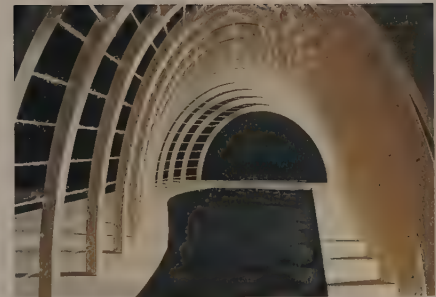
How does architecture fit in to this? I believe we can build more thoughtfully. In the UK, we have a system called BREEAM – the Building Research Establishment Environmental Assessment Method – which gives an overall green rating to a building. NGP used this system for the first time on the RAC building and, working from scratch with a resource consultant, we managed to achieve a rating of 8 out of 10 in the assessment. Next

time I hope we can do even better. Factors which were taken into account in the rating were the materials used in construction, the energy consumption of the completed building and the recycling capacity of the materials used. The shape of the RAC building is also about as compact as you can get, which increased the rating.

The shading system on the outside of the building was applied to protect working conditions within, to prevent solar gain and heat build-up. At the same time, the ability to see out across the countryside was considered very important as most of the employees in this building were working at computer screens all day. The other thing we pioneered in this building – if you can call it pioneering – was the absence of lifts.

The three-storey building is entered at the middle floor, so you only have to go up or down one flight of stairs to get where you want to be. All the movement in the building takes place in the atrium – where the 500 staff pass through and meet, which creates a very good atmosphere. There are lifts in the building, but these are for the use of disabled people and for the occasional shifting of stationery and so on up and down the building. At first, people were shocked by this staircase idea, but it is now a fact of life that you move around the building on foot.

I now turn to my second theme – flexibility, and making buildings with built-in capacity for future change. In my view, the bones of a building should always be clear and well articulated. An early model of Ludwig Erhard Haus, which contains the Berlin Stock Exchange, looks almost like a contoured hillside. Our proposal occupied the whole of the site, and I think one of the winning factors of the design was keeping the building height low. A primary



An early model of the Ludwig Erhard Haus.



Satellite telecommunications.

design issue was to create a flexible ground floor area for the Stock Exchange and the conference centre (which changed in size four times during the design process). After all, it is the ground floor spaces of a building that are most likely to need to change. All columns were omitted, and the floors are hung from prefabricated steel arches. A building with good bones will endure and can tolerate additions. Just for amusement, I speculated on what would happen if the Stock Exchange moved out and realized that an ice rink could be accommodated here, although I'm not quite sure what my clients would think about that idea!

I like the idea of a building shedding its skin, rather as a lobster sheds its carapace. This digital drawing shows the alternate bands of cladding and glazing on LEH, just like an animal skin. The way a weaverbird rebuilds the same nest every year is also a process of recycling. The strong visual connection between the bird's nest and the construction of this linear accelerator makes a nice analogy between nature and technology.

When we designed the Herman Miller building at Bath, we made the skin completely flexible. The glass, the cladding panels, the doors and even the courtyard spaces could be moved around on the outside of the building. The building is now twenty years old and has gone through many changes. Everybody likes it, indeed it won one of the first Civic Trust Awards for a contemporary building and several other architectural awards. However, interestingly, planners don't quite know how to deal with this continuously evolving building.

When doing the second Herman Miller building in Chippenham, we used aluminium panels which are more ecologically sound than fibreglass because they can be

recycled. Once again, the whole idea was that the panels and doors could be moved and further areas of glazing could be incorporated. When we began the project, this building was to be used purely as a warehouse. Now it has changed in use to accommodate a considerable amount of manufacturing and offices as well.

For the Igus plastics factory in Cologne, Germany, we further developed the idea of the moveable panel. The panels are simply attached with tabs and can be replaced with windows, even by the workforce inside the building.

I want to stress that flexibility is important in buildings, but that this does not prohibit them from being beautiful or well-designed and well co-ordinated.

I don't think there has been a strong tradition of flexible and elegant building in the UK. It has been said many times that ours is a nation of lean-to buildings. At the heart of every industrial plant, you almost always find a nineteenth-century brick building which has been added to over the years. It is very seldom that anyone in this country starts off, even now, with a masterplan for growth and change for their buildings.

It won't be very long before buildings really can change their skin – their colour and even texture – in the same way that a chameleon can, or a chevron butterfly fish, which changes its colour between day and night.

The adaptable skin is a fascinating path to pursue. We continued to develop this theme with our competition entry for the extension to the Victoria & Albert Museum. Our idea was for a building that acted to orientate people, and enabled them to find their way around the seven miles of existing corridors at the V&A. We also wanted to create a building skin like a living, changing shop window, which would demonstrate what was going on in the

museum – a dynamic facade. The various museum departments would each take over the facade for a set period and would be able to display their own objects through either directed lighting or using back projection on different kinds of glass. Unfortunately it was not to be, and the competition was won by, what I would say is, basically, an old-fashioned monument-type building.

The idea of a building shedding its skin to reveal a completely new surface underneath is an appealing one. Another aspect of flexibility is change of use, or the evolution of use in buildings. In London, generally, there has been a considerable amount of adaptation of existing office buildings recently, particularly their conversion into apartments, which is something many people thought would never happen. It is not an issue exclusive to cities either – there are some very fine redundant buildings in the countryside which, with thought and care, could be successfully reused.

My third theme is communications which, in my view, are going to affect buildings in a major way. Developments in telecommunications have implications for urbanization at a very large scale. It is possible that countries that have already undergone extensive urbanization with chaotic results may encourage developing countries to rethink, and to remain decentralized.

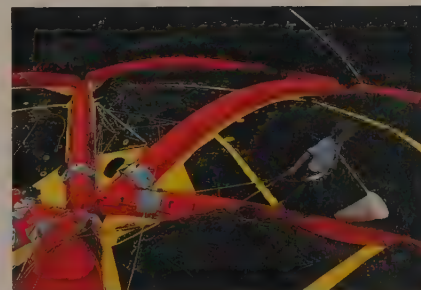
One fascinating development is that some countries, which had no previously installed telephone posts and wires, have now actually opted not to have a wire network at all. Instead they have gone straight to a mobile telephone system with aeriels placed at strategic intervals throughout the country. This, of course, saves thousands of miles of telephone wire and poles, and all the other waste that goes with it.

We hear a great deal nowadays about people working from home. However, I found it incredibly difficult to find images of these people, either because they don't want to disclose the untidiness of their home-workstations, or because they are in some other way ashamed of them. It is intriguing that well organized home-work places do not yet seem to have materialized.

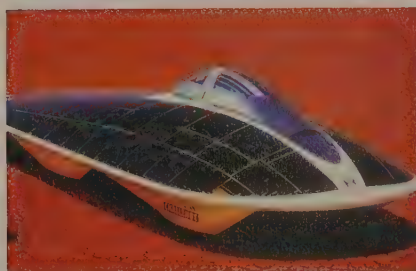
If the idea of home-working takes root, the notion of the city as primarily a place of work will change dramatically. Its role will evolve, perhaps into that of a cultural exchange. In Berlin, a few years ago, there was a marvellous event in which the artist, Christo, wrapped up the entire Reichstag building from top to bottom. It was one of the biggest events in the city for many years. Similarly, the Palio in Siena, or the great festivals of Japan, are events people visit to exchange cultural experiences.

I do not ultimately believe that people will turn their backs on cities. It is more likely that there will be a mass demand for improvement in the quality of life in cities. In Paris, there has long been a tradition of open-air cafés, and an interesting intermediary type of space, spanning between the outdoors and the indoors, has evolved. This is something that has great potential in the UK climate, and that could be extremely beneficial to street life in general. One of the repercussions of increased environmental awareness is that people are scrutinizing the quality of their lives much more closely.

Improved public transport is increasingly a key issue for governments, and it is one of my hopes that this will be given higher priority in the UK. In mainland Europe, the introduction of tram systems is now widespread; even in Manchester, tram systems are now in use. In order to get people out of their cars, there has to be an alternative



Ropebridge in the rainforest, top, and an inflatable rig enabling research of the forest canopy.



Camels transporting solar cells
and a Honda solar-powered car.

public transport option of similar quality. If this can be provided, then we have a chance of reducing the amount of traffic on the roads and therefore greatly improving air quality, which is one of the main health issues affecting people in cities.

I now turn to my fourth theme – the relationship of city-dwellers with nature, and an increased yearning for what might be called the 'natural' environment. This issue of the desire to get away from urban life is something we are going to see more and more of in the next millennium. People are increasingly looking for a new dimension in their lives – whether it is escape to mountains, to forests or jungle, to the sea, or even under the sea.

I have no doubt that one of the central dilemmas of the next millennium will be how we can enjoy the wonders of the natural world without, at the same, time destroying it. This image of the detritus left behind by a mountaineering expedition is poignant because the intention of that expedition was to seek out an unspoiled landscape. One solution is to simulate, as in this completely artificial beach that has been constructed in Japan. Whereas in Europe the concept of an artificial beach might not immediately appeal, in Japan this project is a roaring success.

This brings me to the Eden Project. The aim is to rework an entire valley that has been scarred by clay mining, to landscape it, and to enclose part of this landscape with the lightest possible of structures. In many ways, we will create a lost world.

The task is how to explain different kinds of plant life and climate so that people can experience these things without necessarily travelling half way around the world. It is, in fact, a way of experiencing the natural world without despoiling it. There are, however, good and bad ways of

doing this. Eden will not be some kind of leisure or theme park. It is a serious research project into the reclassification of plants as a result of discoveries in botanical genetics, and that is the direction in which everyone involved in the project wants to steer it. Obviously, we also hope people will enjoy the architecture – both the geometry and the detailing of this structure.

We are investigating various non-invasive ways of viewing nature. We have looked at tree bridges and hope to work something of that approach into Eden. We were inspired by a fascinating inflatable structure, like a spider's web, which is lowered on to the roof of the rain forest to provide a platform from which scientists can research, take samples and examine flora and fauna. The highest priority is that we should not destroy the landscape we have learned to appreciate.

The fifth theme I would like to touch on briefly is that of the decline of the manufacturing sector in the developed world and the emergence of knowledge-based industries. I believe this has the potential of being a positive development. If we are forward-looking, rather than simply mourning the loss of our nineteenth-century heritage, we can all gain from this shift. In the UK alone, the design, leisure, computer software, banking, tourist, fashion, film and television, and magazine and newspaper industries are huge employers and generate large amounts of income from abroad. Knowledge-based industry is here to stay, and needs to be considered as part of the economic base of all countries in the next century.

I now come to my final theme – the relationship between the so-called developed world and the undeveloped world. I have discussed the city in terms of enjoyment and happiness, and as a place to come to for

great cultural events – opera or ice skating and marvellous celebrations. The city is not only a place for people to work in. I have also talked about the lessons that the developed world has learned, and about how we might share this knowledge with the developing world. Do we, having experienced sometimes catastrophic urbanization, encourage developing countries to retain their rural idylls and persuade them that piling into cities is not such a brilliant solution? Or is it patronizing to tell them they would be happier to continue building beautiful huts? Is it just about maintaining the natural environment so that the *National Geographic* can go and take beautiful photographs for the rest of us to enjoy?

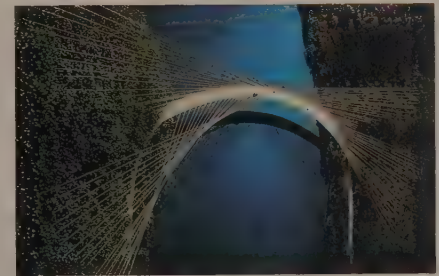
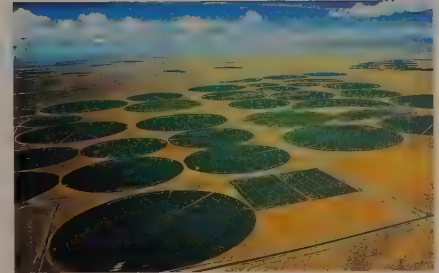
The problem is persuading developing countries to retain their forests as they strive to match Western levels of development. How do we, the developed world, get that message across when, after all, we have cut down our forests to make fields so that we could cultivate crops and graze cattle? We need a considerably more sophisticated argument than simply 'don't do it'.

However, there are things we can do to make our intervention in the affairs of the developing world useful. It is no longer necessary for the wealth of a country such as the UK to rest on its manufacturing industry. There is much work for consultants on projects in the developing world, such as bridge building, irrigation schemes, solar projects or dam building. Schemes such as these produce marvellous benefits for developing countries and, in exchange, income for the developed countries. I believe there will be an increase in this type of work.

It is not widely known that we were trying to get this idea of the use of specialist knowledge across in our UK Pavilion at the Seville Expo. The building itself was an

exercise in energy conservation and won an award for the smallest energy consumption of all the 106 pavilions in Seville. One of our proposals for recycling the building, which unfortunately wasn't taken up by the government at the time, was that the solar cells on the roof of the pavilion could be shipped off to be used to run a pump (of the same type used to cool the outside of the building with water) which would then fill water tanks. Each group of generators and solar cells could pump the water supply for a small village in the developing world. I thought this was a great scheme for the Foreign & Commonwealth Office to pursue after the Expo, but instead they sold the pavilion off to the highest bidder.

I hope that, by discussing the issues of global responsibilities, I have touched a few nerves and generated some thought. This image is of an aircraft park in America where the planes are grounded and broken up for recycling. I thought it made a nice juxtaposition with this other image of a very old building being 're-skinned' with simple hand-moulded clay. Both images convey messages of great hope, and illustrate what I have been saying in this lecture – that if we think seriously about the global environment we can organize our lives so that we don't destroy the planet we live on.



Irrigation systems in New Mexico and the unbuilt Rock-a-Chucky Bridge, California.

Interview with Nicholas Grimshaw

This interview is based on conversations between Nicholas Grimshaw and Enrique Walker which took place between March 1995 and May 1999.

An extract of the interview is also published in *12 Entrevistas con Arquitectos*, by Fabio Oppici and Enrique Walker, Ediciones ARQ, Santiago, 1998.

EW *You once said that your work can be understood as part of a long-standing tradition of British architecture born out of engineering, one which can be traced back to Paxton's Crystal Palace and the railway stations and greenhouses of Victorian engineers. What role do you assign to your work within this tradition?*

NG I think British architecture is deeply connected to engineering inventiveness. We are a nation of constructional innovators – railway stations and bridges built by British engineers in the nineteenth century can be seen all around the world. Earlier, this inventiveness can be seen in our great tradition of ship-building, particularly in the seventeenth and eighteenth centuries. I would argue that British architecture has been heavily influenced by the structural design of those ships. The tradition was continued, as you say, in the work of Paxton and Brunel, and then through the two world wars in which Britain was involved. For instance, many people have claimed that the Spitfire was the decisive element in the Battle of Britain in the Second World War. And the efficiency of this aeroplane was entirely due to its design. It was an eccentric machine in the sense that was difficult to build and mass-produce, but at the same time it was brilliantly designed, able to twist and turn faster than any of the opposing aircraft. So, to be far-fetched, you could say the Battle of Britain was won on design.

Now, at the turn of the millennium, in a comparison between the engineering tradition and the other tradition of British architecture (the craft tradition of brick and thatch buildings), it is our engineering tradition that looks more solid. Paxton and Brunel were certainly great innovators – they believed in a good skeleton; they felt there had to be a certain honesty in a good structure. Design for them was nothing to do with appearance or decoration, it was to do with the way the whole building worked, how the parts were integrated and held together, from the structure right down to the detail. I would say we look at our work very much in that way too. We have taken on those ideals of design integrity and have attempted to take them further by exploiting the potential of new materials.

EW *Do you think this tradition of innovation is necessarily one which is rooted in the use of a material? In other words, is it to be understood solely as a tradition of building in steel? You once said steel was almost an indigenous material in England ...*

NG In some ways it is an indigenous material. Since the construction of Iron Bridge in 1779, we have had a history of building in cast iron, wrought iron and then steel. The raw materials existed here – we had iron ore and also coal with which to smelt it. British steel was exported around the world for the construction of railway stations and all kinds of prefabricated structures, not to mention railway lines and other infrastructure. But I don't think this has ruled out the use of other materials.

In fact, there are also traditions of building in timber, brick and stone. Brick and stone, being essentially compressive materials, tended to demonstrate their structural capabilities in the flow of forces to the ground, as seen in the marvellous flying buttresses of our cathedrals or in the massive brick arches supporting many of our railway viaducts. The fascination for me is when tension first started to be used; this effectively began with cross-bracing in timber-framed structures and is clearly demonstrated in some of our marvellous early tithe barns.

And there is also aluminium. What is interesting about aluminium is that, in about twenty years time we will be able to stop mining it and instead continuously recycle the aluminium that has already been produced. The recycling process uses only 20 per cent of the energy used in the original smelting, and apparently the metal gets better and purer each time. Aluminium used to be a rare commodity in this country; now, one could argue that it is another material indigenous to England, because we may already have as much as we need.

EW *Besides growing out of this engineering tradition, your work is strongly linked to the explorative climate of the late sixties in England – the work of Cedric Price and Archigram, for instance – particularly regarding the fascination for the new, the drive forward. The issue of innovation is actually contained within the engineering tradition you have just referred to. To what extent does your work look forward and to what extent does it look backwards?*

NG In retrospect, I think that climate exerted a strong influence. At that time, there was a sort of philosophical obligation to recognize the age you lived in and to speculate on the future, to look forward. In that respect, Archigram was certainly influential, as was Cedric Price. But at the time we were quite critical of Archigram, because we thought their work was mainly visually-orientated. It seemed that they were rather divorced from reality, and that faced with the potential of building they would turn away and not want to get involved. In many

ways they were deliberately backing away from any direct engagement with construction.

Conversely, my own direction as an architect has grown out of a passion for building. My whole philosophy about what should and should not be done has grown out of doing. At that time (the sixties) I was fascinated by systems and mechanisms, and by the way components are assembled. I was also interested in new materials – steel, glass, plastic – and in their potential to break away from the aesthetics of hard-edged concrete, and the right-angled Modernist architecture of the time. The very first project I did was the Service Tower. It was then that I realized the potential of component construction and prefabrication. The steel structure was delivered to site and bolted together within three weeks, while the nineteenth-century building the tower was attached to had to undergo months of repair. That steel structure had a profound impact on me.

I think my work looks both forward and backwards. We are well acquainted in the office with modern materials and methods of production – casting, extrusions, and so on – but at the same time we see our work as being part of an historic tradition. For instance, we acknowledge that casting techniques, which we often use, were first used about four thousand years ago for bronze statues.

A comparison can be made with Piano and Rogers' Pompidou Centre, for instance, which used existing mass-production techniques. But when the building appeared, it was regarded by many as completely innovative, completely avant-garde. Richard Rogers was very much into those techniques and understood very well how they worked, but he didn't actually acknowledge the historical roots of that building, he didn't choose to look back. I think he preferred to be seen as forward-looking. I like to see my work rather as part of a continuum.

EW *We could say that the Service Tower contains all the strands your work was subsequently to develop. Everything is in embryo there – component construction, mass-production techniques, prefabrication. It is possible to draw a direct line between your current work and that early project ...*

NG Yes, but I have to say that, at the time, I hadn't thought it all through yet. I wasn't working to a manifesto. The Service Tower was an instinctive response to the problem of stacking bathrooms at the back of a terrace of six-storey nineteenth-century houses which were being converted into student accommodation. The tower concept was very much connected to my thesis

project at the Architectural Association – a highly mechanistic and flexible university in Covent Garden which was based on a system where all components could be changed, and elements could be bolted in or taken away. At that time, issues concerning flexibility in architecture were beginning to emerge. That tower was a small segment of the thesis project, a practical demonstration of the principles involved. But you are quite right, plenty of the elements in the Service Tower have been developed in the office since then. The tower was about structure, space and skin – the three key words I used as the title of my previous book.

EW *Flexibility was one of the issues at the forefront of the architectural debate at the time...*

NG Flexibility was an issue which influenced us all. My thesis project at the Architectural Association was very much imbued with the idea of transformation. I have always subscribed to the notion of buildings as organisms which respond to change. This idea has been central to many of our buildings, particularly our industrial ones. We have always believed that a workforce should be able to intervene to modify their environment. For instance, the whole facade of the Herman Miller Factory could be manipulated. All panels were interchangeable – glazed panels could be inserted wherever more daylight was required, door panels could be added for more points of access. That concept was developed further in the igus Factory in Cologne. There, not only could the skin be completely altered, but the building itself could grow – as indeed it has done. We took the concept of flexibility still further with the Ludwig Erhard Haus in Berlin, which has a wide-spanning structure from which everything is hung, so that all floor levels can be removed and changed completely. The building will contribute to urban life in Berlin by creating a space which can undergo numerous metamorphoses.

EW *You once stated that your work aims to attain integration of skin and structure, and have used the examples of a seashell and a bat's wing to illustrate this integration. Your early work celebrated mainly structure, whereas your current work has moved towards the integration of structure and skin. However, it could be said that it is precisely the independence of structure and skin that enables change ...*

NG I think integration of the two is absolutely critical. The Pompidou Centre, for instance, is a marvellous

building, but probably the biggest criticism is its skin – it doesn't work terribly well. Our work tries to integrate structure, space and skin, but there are many other issues we are concerned with, especially the issue of flexibility. As you say, the perfect combination of structure, space and skin might not provide a very flexible building, because it could become a finite composition in its own right.

Combining structure and skin while still creating a building with the ability to change is actually quite a difficult task. But I don't think that making them work close together necessarily inhibits change. It perhaps controls change, in the sense that you wouldn't take the whole facade of a building and replace it. The Eden Project has a lightweight structure which is clad by the insertion of panels. We are using a very thin, high-tech material called ETFE, a transparent foil which we use triple skinned and air-inflated. Technology is continually evolving, and new materials in the form of membranes and foils are being developed all the time. The Eden Project was designed with the deliberate intention of changing the panels as materials develop. In fifty years' time, the structure can be filled with a newer, cleverer material. But that sort of change retains the integration of structure and skin. If you have a structure with a skin simply attached to it, then you can strip the skin away and keep the structure, whereas if the two are more integrated the change is, to a certain degree, controlled.

EW *In your recent work, this integration of skin and structure has been increasingly accompanied by the development of more complex geometries. This has certainly been stimulated by a shift in the concept of mass production. These days it is possible to employ the methods of mass-production to create unique structural components. Waterloo International Terminal can be understood as a turning-point in your work ...*

NG Yes. Our early industrial buildings followed more rigid geometries. We did worry a great deal about grids – about going off-grid, or about elements which might cut into the grid. To some extent, this is the nature of industrial buildings – a series of influences push your design in one direction. As you have said, the structure for Waterloo International Rail Terminal didn't follow a repetitive pattern, so we had to rationalize the component system to bring the number of changing members to a minimum. I think the development of computers is also an important factor in this shift. Today, there are tools that allow us to develop increasingly

complex three-dimensional structures. It is now possible to produce shapes that are more fluid and closer to natural forms – something I am extremely interested in. I would say that computers have allowed us to respond in a more integral way to more complex site situations. For instance, at Waterloo the curved shape of the structure emanated from the railway lines themselves, and at Western Morning News the structural form came from the shape of the hillside. However, these developments in technology don't mean that one is not constrained by the same degree of rigour. You have to make structure and geometry work in an equally rigorous way, even if you are using shapes that are more organic. It's possible that you need even greater discipline ...

EW *As you pointed out in your lecture Structure, Space and Skin, boats have been a conceptual point of reference for your work. You also said that you would like buildings to respond in the same way a boat responds to the wind. Could you expand on this issue?*

NG Boats are like living organisms. They can be changed – masts can be removed, sails can be folded – and they have the ability to respond to structural forces in a much more sophisticated way than buildings. It is fascinating how responsive a boat can be to enormous forces coming from different directions – from the sea, from the wind, and so on. We don't allow our buildings to move, to be anything like as responsive. I would love to do a building which could turn and move in the wind, which would lean in the direction of the wind. I think architecture will become increasingly responsive to the environment as time goes by, and as new materials for responsive skins are developed. We have learnt a great deal from boat-building, particularly about structure. Masts, for instance, are not consistently cylindrical but tapered to improve structural performance. At Waterloo we shaped the members in the same way. Apart from anything else, if you bring fat tubes together at one point you get some horrible overlaps – one of the things that can make a steel structure look rather crude. Tapering the tubes made some of the detailing easier, and gave the structure a much greater degree of elegance.

EW *You once stated that detailing is the cornerstone of your work. You see detailing as the result of thorough thinking-through; however, the issue of detail is inevitably related to the issue of decoration. What value do you ascribe to detail in your work?*

NG I would say we aim at details whose purpose is visible. The clear expression of purpose is another reason why I am so drawn to boats. On a boat you seldom see a detail which isn't pared right down – their design is always driven by purpose, not decoration. It is very seldom that you see anything unnecessary on a boat – perhaps on a canal boat you may find some applied decoration, but not on a sea-going boat. I am not against decoration, but I don't see it as a starting-point for design.

I would say our approach is more related to sculpture than to decoration. I do think people get satisfaction from details, from the way in which materials are assembled. There can be poetry in details. However, there are parts of a building where you want to express the significance of a detail, and others where you feel it isn't necessary. The Ludwig Erhard Haus in Berlin is probably more restrained than the RAC Regional Headquarters, which is in turn more restrained than the Western Morning News building, which came immediately before it. I would say we are refining all the time, making details simpler.

On the other hand, our details are closely linked to an understanding of manufacturing processes, how things are actually made. We have learnt from these processes over the years – what is easy to make, what is cheap to make, what level of mass-production you need to justify the economics, and so on. That learning has in turn informed the bigger scale. Some of our buildings have benefited enormously from that. For instance, at Western Morning News we developed the idea of the arm first applied in the Financial Times Building, and turned a welded structure into a casting. We did all the calculations for that – some people argued that the welded version was cheaper because it used flat steel bars but, when taking into account the time taken for the welding, we realized we could actually afford to cast it. The end result was a really beautiful cast arm.

The components of a building are like the parts of a watch, they get smaller and smaller. A clockmaker would design every last component in a wristwatch, down to the tiniest screw. The same care is taken in our work, level-by-level, all the way down through the structural hierarchy of a building. We try to do it thoroughly, right through from start to finish.

EW *I would say that your current work is very much developed from the components to the building as a whole, whereas in your early work design was governed by overall geometric layout ...*

NG Actually, I would say the way I like to work is to scan from one end of the project to the other, back and forth. I may well be thinking about a small detail very early on, but at the same time I am thinking about the overall scheme. It certainly isn't a formal process that starts with the large-scale and then focuses closer and closer down to the detail. I think this is partly because one develops a vocabulary of details, of materials you have used, of spaces you have formed. An architect uses that vocabulary as an artist uses a palette of colour. Nothing is ever started from scratch, one is always developing the vocabulary.

EW *You subscribe to an architecture which is flexible and open to transformation over time and as a result of changes in use. What do you think about transformation as a consequence of ageing?*

NG Ageing is as much a practical issue as a theoretical one. I think it is wrong to use an enormous amount of money to keep a building going, but it is also ridiculous to suggest that any building will survive without maintenance. I believe it was Buckminster Fuller who used to say, 'a much-loved cardboard house will last forever'. I think that, for as long as people want to keep things, they will manage to. As long as people believe in a building, it will stay there – people will go on repairing it. So, good buildings will always survive. But that doesn't mean buildings can't be altered and changed. The architect's work finishes when the building opens. In that sense, designing is like giving birth to a child, but without the chance to have a say in the child's upbringing. As I have said, buildings are for the users, so it follows that an architect should allow for those users to participate in the building's growth and development.

Awards, 1993–1999

Royal Institute of British Architects

- 1994 Western Morning News Headquarters, Plymouth (South West Region)
- 1994 International Terminal Waterloo, London (President's Award Building of the Year)
- 1995 RAC Regional Headquarters, Bristol (National and Regional Award)
- 1999 Orange Operational Facilities, Darlington (Regional Award)
- 1999 Mabeg Offices, Soest (Regional Award, Europe)

Structural Steel Design Awards

- 1993 Western Morning News Headquarters, Plymouth (Commendation)
- 1993 British Pavilion Expo 92 Seville (Joint Winner)
- 1994 International Terminal Waterloo, London (Winner)
- 1995 RAC, Bristol (Commendation)
- 1999 Orange Operational Facilities, Darlington (Commendation)

Civic Trust Awards

- 1996 The Compass Centre (BA Centre for Combined Operations)
- 1996 International Terminal Waterloo

British Construction Industry Awards

- 1993 gus Plastics Factory, Cologne (High Commendation & Special Commendation)
- 1993 Western Morning News Headquarter, Plymouth (High Commendation)
- 1995 International Terminal Waterloo (High Commendation)

Royal Fine Art Commission/

Sunday Times Building of the Year Award

- 1993 Western Morning News Headquarters, Plymouth (Commendation)
- 1994 International Terminal Waterloo, London (Transport)

Other Awards

- 1993 Aluminium Imagination Architectural Award Pier 4A and Satellites, Heathrow (Winner)
- 1993 Qualita Urbana en Europa Award presented by Bologna Fiere International Terminal Waterloo, London
- 1993 The Abercrombie Award for Architecture presented by Plymouth City Council
- Western Morning News Headquarters, Plymouth
- 1993 Quaternario Foundation International Award for Innovative Technology in Architecture (Gold Award) International Terminal Waterloo, London
- 1994 Mies van der Rohe Pavilion Award for European Architecture International Terminal Waterloo, London
- 1994 EMAP Architecture Highlight Award International Terminal Waterloo, London
- 1995 AIA/London UK Chapter Design Excellence Award International Terminal Waterloo, London
- 1995 AJ Centenary Medal for Contribution to Architecture
- 1995 MIPM Award for European Office Building of the Year (Runner up) Western Morning News, Plymouth
- 1995 Concrete Society Award – Commendation RAC, Bristol
- 1995 International Association of Lighting Designers – Commendation BA Combined Centre for Operations, Heathrow (COC)
- 1995 National Heritage Arts Sponsorship Scheme Award (ITW)
- 1995 Financial Times Industrial Architecture Awards – Commendation International Terminal Waterloo
- 1996 Design Innovation 96 – Highest Quality Design NGP Profile 1 signage system designed for Mabeg.
- 1996 British Council for Offices Award – Best Delivered Workplace BA Combined Centre for Operations, Heathrow (COC)
- 1996 Lighting Design Awards. Commendation (RAC)
- 1996 The Glasstex Industry Award RAC Bristol (Winner)
- 1996 International Brunel Award for newly constructed large station International Terminal Waterloo
- 1999 Lord's Grand Stand – Concrete Society 1999/2000 Millennium Award

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Stadt Bauwelt 26 September 1997: p.1961
ZOO October 1999: 'Nicholas Grimshaw & Partners: Fundacion Caixa Galicia and Advanced Technology Institute', Steve Hare, p.132

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Project Data

RAC Regional Headquarters, Bristol, UK, December 1992–October 1994

Building type Offices

Overall area 7,150m²

Contract value £10.6m

NGP Nick Grimshaw, Christopher Nash (directors in charge), Mark Bryden (project architect), Eoin Billings, Robert Elliston, Duncan Jackson, Julian King, Mike Waddington, Martin Wood, Sarah Yabsley

Client RAC Motoring Services Ltd

Structural engineer Alan Baxter & Associates

Quantity surveyor Hanscomb Partnership

Services engineer Ove Arup & Partners International Ltd

Contractor Bovis Construction (South West) Ltd

Landscaping Edwards Gale

Fire consultant Locke Carey Associates

Cladding consultant Arup Facades

Catering consultants Contract Catering Consultants Ltd

Caixa Galicia Foundation Building, La Coruña, Spain, September 1996–2003

Building type Private gallery for bank's art collection

Overall area 7,600m²

Contract value £15m

NGP Nick Grimshaw, Andrew Whalley (directors in charge), Keith Brewis (project director) Kirsten Lees (project architect), Antoine Buisseret, Tom Coward, Amanda Davis, Felna Fox, Birgit Greulich, Perry Hooper, Neill McClements, David McDowell, Benedict O'Looney, Juan Porral-Hermida, Steve Ritchie

Client Caixa Galicia

Structural engineer Ove Arup & Partners International Ltd

Quantity surveyor Davis Langdon & Edetco

Services engineer Ove Arup & Partners International Ltd

Contractor t.b.c

Fire, communications, security, acoustics,

facades and lift consultants Ove Arup & Partners International Ltd

Access consultants Access Design Ltd

Lift contractor Europa Access Systems Ltd

Ludwig Erhard Haus, Berlin, Germany, May 1991–September 1998

Building type Commercial office building with stock exchange, conference centre, exhibition space and restaurant

Overall area 39,000m² (gross)

Structural dimensions arches are on a 6.90m grid; hangers on a 6.75m grid

Contract value £66m

NGP Nick Grimshaw, Neven Sidor (directors in charge), Michael Pross (project director, Berlin), Ingrid Bille (associate in charge, London) London Team: Rowena Bate, Martin Bauer, Stefan Camenzind, Garry Colligan, Gavin Finnan, Kai Flender, Paul Grayshon, Andrew Hall, William Horgan, Ewan Jones, Matt Keeler, David Kirkland, Angelika Kovacic, John Lee, Benedict O' Looney, Stuart Piercy, Will Stevens, Dorothee Strauss Berlin Team: Andre Burmann, Thomas Deuble, Philip Engelbrecht, Raphael Forny, Birgit Greulich, Jens Hardvendel, Markus Hetzel, Carsten Kromschröder, Beate Müller, Susanne Raynor, Helle Schröder, Simon Wacker

Client Berlin Chamber of Commerce

Structural engineer Whitby and Bird; Specht Kalleja und Partner GmbH; Krupp Sthalbau (Berlin) GmbH

Quantity surveyor Davis Langdon & Everest; Mott Green Wall

Services engineer RP+K Sozietät

Project manager Büro4/SMV; Coopers and Lybrand

Construction manager Michael Weiss and Partners

Acoustic consultant Müller-BBM GmbH

Fire consultant Hosser, Hass und Partner

Cladding consultant Emmer, Pfenninger und Partner

Bath Spa, Bath, UK, March 1997–2001
Building type Spa complex including 4 spa baths, massage and treatment rooms, steam rooms, gym and hydrotherapy
Overall area 3,650m²
Structural dimensions Cube dimensions: 16 x 16 x 16m
Contract value £10.5m
NGP Nick Grimshaw (director in charge), Florian Eames (project director), Miriam Fitzpatrick (project architect), Chris Butler, Simon Dickens, Leonard Milford, Diane Murdoch, Benedict O’Looney
Client Bath and North East Somerset Council & Thermae Development Company bv
Structural engineer Ove Arup & Partners
Quantity surveyor Bath and North East Somerset Council
Services engineer Ove Arup & Partners
Conservation architect Donald Insall Associates
Project manager Bath and North East Somerset Council
Energy study Ove Arup and Partners
Façade engineering Ove Arup and Partners
Water treatment specialists Ove Arup and Partners
Lighting consultants Speirs and Major
Right of light consultant Anstey Horne
Artist Vong Phaophanit
Advisor British Spa Federation, Medical Division

Lord’s Grand Stand, London, UK, April 1995–June 1998
Building type 6,000-seat grandstand, 25 boxes, bars and restaurant
Overall area 6, 760m²
Structural dimensions 95.4 x 20.2 m mast: 35m high
Contract value £10.8m
NGP Nick Grimshaw, David Harriss (directors in charge), David Portman (associate in charge), Simon Dickens, Jason Embley, Miriam Fitzpatrick, Jim King
Client Marylebone Cricket Club
Structural engineer Ove Arup & Partners
Quantity surveyor Davis Langdon & Everest
Services engineer Ove Arup & Partners
Project manager Gardiner & Theobald Management Services Ltd
Planning supervision Gardiner & Theobald Planning Supervision
Planning consultant Gerald Eve
Rights of light Anstey Horne & Co
Tree consultant Ian Keen Ltd
Catering consultant Town & County Catering

IJburg Bridges, Amsterdam, The Netherlands, June 1997–August 2000
Description To connect mainland with artificial islands in the IJmeer. Including 3 traffic lanes, 2 tram lanes, 2 cycle paths, 2 footpaths and services
Overall area 2001 total bridge deck area: 11,000m²
Structural dimensions 2001: 220m span
Contract value £19m
NGP Neven Sidor (director in charge), Kai Flender (project architect), Florian Eckardt, Nick Grimshaw, Ewan Jones, Angelica Kovacic
Client Gemeente Amsterdam
Structural engineer Ingenieurs Bureau Amsterdam (IBA); WS Atkins (Oxford)
Quantity surveyor IBA
Services engineer IBA
Project manager Projectgroep IJburg Gemeente Amsterdam
Contractor t.b.c
Masterplanner Projectgroep IJburg
Lighting Philips/IBA

Orange Call Centre, Darlington, UK, December 1995–March 1998
Building type Call centre
Overall area 5,600m²
Structural dimensions 60 x 72 x 9m
Contract value £7.5m
NGP Nick Grimshaw, Christopher Nash (directors in charge), Simon Beames (project architect), Simon Dickens, Matthew Eastwood, Kenny Fraser, Kilian O’Sullivan
Client Orange PCS Ltd
Structural engineer WSP (Wimbledon)
Quantity surveyor Gardiner & Theobald
Services engineer WSP (Bristol)
Project manager Gardiner & Theobald Management Services
Contractor Taylor Woodrow Construction (Northern)
Masterplanner Nicholas Grimshaw & Partners
Estates consultant King Sturge
Landscape architect Edwards Gale
Feng Shui consultant Patrick Wong Mism
Fire engineering consultant Locke Carey
Catering consultant Catering Developments Ltd

The Eden Project, Cornwall, UK, January 1996–April 2001
Building type Botanical Institute for education, research and public attraction
Overall area 23,000m² (Biomes), site area 15 hectares
Structural dimensions 450m end to end, 100m max. horizontal span, 45 m max. height
Contract value £53m
NGP Nick Grimshaw, Andrew Whalley (directors in charge), David Kirkland (associate in charge), Jolyon Brewis (associate in charge), Michael Pawlyn (project architect), Vanessa Bartulovic, Dean Boston, Chris Brieger, Antje Bulthaupt, Vincent Chang, Amanda Davis, Florian Eckardt, Alex Haw, Perry Hooper, William Horgan, Oliver Konrath, Angelika Kovacic, Quintin Lake, Richard Morrell, Tim Narey, Monica Niggemeyer, Killian O’Sullivan, Debra Penn, Martin Pirnie, Juan Porral-Hermida, Mustafa Salmon, Tan Su Ling
Client Eden Project Ltd
Structural engineer Anthony Hunt Associates
Quantity surveyor Davis Langdon & Everest
Services engineer Ove Arup & Partners
Project manager Davis Langdon Management
Contractor McAlpine Joint Venture
Masterplanner Land Use Consultants
Planning consultant Arup Economics and Planning
Landscape consultant Land Use Consultants
Fire consultant Arup Fire
Planning supervisor Aspen Burrow Crocker
Cladding consultant Arup Façade Engineering
Access consultant Purcell Miller Tritton

Mabeg Office Building, Soest, Germany, 1996–99
Building type Administration building
Overall area 800m²
Structural dimensions 4.5 and 6.0m grids
Contract value £800,000 (inc. 16% VAT)
NGP Nick Grimshaw (director in charge), Michael Pross (project director, Berlin), Thomas Deuble, Helle Schröder
Client MABEG Kreuschner GmbH und Co.KG
Structural engineer Specht Kalleja und Partner (Berlin)
Services engineer Kuehn Bauer Partner (Berlin – Munich)
Construction manager Passgang und Sprengkamp (Lippstadt)
Contractor various
Masterplanner Nicholas Grimshaw & Partners
Building physics and acoustics Müller BBM (Berlin)

Zürich Airport, Zürich, Switzerland, August 1996–2003
Building type Expansion of two existing airport terminals to provide a new ‘Airside Centre’ and shuttle train station; expansion of mainline train station to provide 60 new check-in desks and a new bus station
Overall area 60,000m² (airside centre); 55,000m² (landside centre)
Structural dimensions max. Airside Centre roof span: 40m; height: 16m
Contract value £205m
NGP Nick Grimshaw, Christopher Nash (directors in charge), Christian Male (associate in charge), John Eger (Swiss consultant), Simon Beames, Jolyon Brewis, (Neil Clark), Chris Dukes, (Rupert Evers), Rafael Forni, (Paul Grayshon), Oliver Konrath, Andy McConachie, Jens Meyer, Richard Morrell, Diane Murdoch, (Tim Narey), Monika Niggemeyer, (Ron Nkomba), Stuart Pierce, Susanne Raynor, Tom Rogers, Eva Scheffler, Britta Siggelkow, (Simon Wacker)
(bracketed names denote participation in competition design only)
Client Flughafen Immobilien Gesellschaft (FIG)
Structural engineer Ernst Basler & Partners; Ove Arup & Partners
Associate architect Itten and Brechtbühl (Zürich)
Quantity surveyor Perolini Baumanagement
Services engineer Ernst Basler & Partners; Ove Arup & Partners
Project manager Ernst Basler & Partners
Contractor t.b.c
Lighting Ove Arup & Partners
Cladding Arup Façade Engineering
Retail consultants John Herbert Partnership

Paddington Station, London, UK, September 1997–December 1999
Building type Station refurbishment/new build
Overall area 86,000m²
Structural dimensions main train shed: 3 spans covering an area 70 x 180m; lawn area 50 x 25 x 12m high
Contract value £42m
NGP Andrew Whalley (director in charge), Keith Brewis (project director), Mark Middleton, Stephen Riddell, James Robson, Neil Stonell (project architects), Idun Back, Eoin Billings, Dean Boston, Chris Brieger, Antoine Buisserel, Antje Bulthaup, Vincent Chang, Neil Clark, Julian Coward, Tom Coward, Max Fawcett, Felna Fox, Birgit Greulich, Nick Grimshaw, Faruk Hadzovic, Jorg Hartenstein, David Hasson, Quintin Hinxman, Perry Hooper, Mark Humphreys, Duncan Jackson, Brian Jennings, Yoon King Chong, Robert Kolack, Annelie Kvick, Quintin Lake, James Langford, Desmond Lavery, Katharina Machule, Neill McClements, David McDowell, Paul McGill, Nick Mouat, Benedict O’Looney, Debra Penn, Martin Pirnie, Juan Porral-Hermida, David Price, Tim Shennan
Client Railtrack plc
Structural engineer WS Atkins
Quantity surveyor Railtrack Property Projects and Capita Property Ltd
Services engineer WS Atkins
Project manager Railtrack Great Western Project Delivery
Contractor Taylor Woodrow Management Ltd
Masterplanner Nicholas Grimshaw & Partners
Planning consultant Ove Arup
Lighting consultant Spiers and Major
Rail consultant Scott Wilson
Retail consultant Rodney Fitch & Co

Victoria & Albert Museum Extension, London, March–April 1996
Building type Museum exhibition and orientation space
Overall area 10,000m²
Contract value (budget) £40m
NGP Nick Grimshaw, Andrew Whalley, (directors in charge), Miriam Fitzpatrick (project architect), Julian Coward, David Kirkland, Mark Middleton, Ron Nkomba, Shin Yong Ho
Client Trustees of The Victoria and Albert Museum
Structural engineer WS Atkins
Quantity surveyor Davis Langdon & Everest
Services engineer WS Atkins
Lighting Speirs and Major
Conservation architect Anthony Blee Consultancy

Spine House, Oberkülheim, Germany, June 1996–2000
Building type 3-bedroom house
Overall area 800m²
Structural dimensions 3.3m grid
NGP Nick Grimshaw, Mark Bryden, Heike Matcha, Martin Wood
Structural engineer Michael Wulf
Quantity surveyor Stefan Schölzel
Services engineer Gereon Blass, Werner Mertens
Construction manager Stefan Schölzel
Landscape consultant Robert Rummey Associates
Spine construction t.b.c.

Industrial Design Projects, 1995–98
Mabeg, 1996
Product type Information and Display System Furniture
NGP Nick Grimshaw, Duncan Jackson, Eoin Billings, Brian Jennings, Naomi Hasluke, Chris Bell, Richard Levene
Client MABEG Kreuschner GmbH und Co. KG
Cemusa, 1995–96
Product type Street Furniture System
NGP Eoin Billings, Nick Grimshaw, Duncan Jackson, Brian Jennings, Esther Perea-Borobio
Client Cemusa: Corporacion Europea de Mobiliaro Urbano, S.A.
FSB, 1996
Product type Door Furniture
NGP Nick Grimshaw, Matt Keeler
Client FSB FrankSchneiderBrakel GmbH und Co
Fusion, 1997–98
Project Exhibition
NGP Chris Bell, Eoin Billings, Nick Grimshaw, Duncan Jackson, Aiden Jamison, Brian Jennings, Richard Levene
Client Nicholas Grimshaw & Partners

Gresham Street Office Building, City of London, UK, September 1997–September 2001
Building type Commercial office building
Overall area 15,641m² (gross)
Structural dimensions 6 x 9.5m structural grid
Contract value £25m
NGP Neven Sidor (director in charge), John Ridgett (project architect), Nick Grimshaw, Ben Heath, Carl Shenton
Client Stanhope Pension Trust Ltd
Structural engineer Whitby Bird & Partners
Quantity surveyor Davis Langdon & Everest
Services engineer Hilson Moran Partnership Ltd
Project manager Jones Lang Wootton
Contractor t.b.c
Planning consultant Jones Lang Wootton
Archeological consultant Museum of London

European Institute of Health and Medical Sciences, University of Surrey, Guildford, UK, April 1997–May 1999
Building type Teaching facility
Overall area 7,500m²
Structural dimensions 70 x 53m
Contract value £8.4m
NGP Nick Grimshaw, Christopher Nash (directors in charge), Kenny Fraser (project architect), Simon Beames, Richard Connor, Matthew Eastwood, Monica Niggemeyer, Kilian O’Sullivan, Stuart Piercy
Client University of Surrey, EIHMS
Structural engineer Alan Baxter Associates
Quantity surveyor Huntley Cartwright
Services engineer Slender Winter Partners
Contractor Lovell Construction Ltd
Planning consultant Robert Shaw and Partners
Landscape architect Mark Westcott
Acoustic engineer Tim Smith
Fire consultant Locke Carey
Cladding consultant Montresor Partnership

National Space Science Centre, Leicester, UK, August 1996–March 2001
Building type Museum/visitor centre
Overall area 7,200m²
Structural dimensions tower: 41 m high; exhibition building 71 x 71 m
Contract value £17.5m
NGP Nick Grimshaw, Christopher Nash (directors in charge), Florian Eames (project director), David Portman (associate in charge), Steve Ritchie (project architect), King Chong, Matthew Eastwood, Jason Embley, Jim King, Andrew MacConachie, Eva Scheffler
Client Leicester City Council; University of Leicester
Structural engineer Ove Arup & Partners
Quantity surveyor Capita Beard Dove
Services engineer Ove Arup & Partners
Project manager Gardiner Theobald Management Services
Contractor Sir Robert McAlpine Ltd
Landscape architects Land Use Consultants
Curtain wall/envelope consultant Montressor Partnership

Frankfurt Messehalle, Germany, August 1999–June 2001
Building type Trade hall/assembly building
Overall area 66,410m²
Structural dimensions 165 x 24m structural bays
Contract value 230,000,000 DM
NGP Nick Grimshaw, Neven Sidor (directors in charge), Ingrid Bille (project director), Simon Beames, Adam Firth, Birgit Greulich, Jens Hardvendel, Ben Heath, Robin Kirschke, Moritz May, John Ridgett, Carl Shenton, Wolfgang Stockinger
Client and Contractor Hochtief
Structural engineer Ove Arup & Partners
Quantity surveyor Hochtief/Davis Langdon & Everest
Services engineer Kuehn Bauer Partners
Fire consultant BPK Brandschutzplanung
Building physics and acoustics Müller BBM

Nicholas Grimshaw & Partners

The team 1993–1999



Chairman
Nicholas Grimshaw

Directors
David Harriss
Christopher Nash
Neven Sidor
Andrew Whalley

Project Directors
Ingrid Bille
Keith Brewis
Florian Eames
Michael Pross

Senior Associates
Garry Colligan
Christian Male
David Portman

Associates
Jolyon Brewis
David Kirkland
Mark Middleton
Stephen Riddell

Armele Adams
Yasmin Ahmad
Alison Allsop-Jones
Shella Aziz
Murline Bagalue
Idun Back
Heather Banks
Kelly Barnbrook
Helena Barrett
Vanessa Bartulovic
Rowena Bate
Martin Bauer
Elizabeth Baza-gette
Simon Beames
Caroline Beasley
Stewart Bernard
Jason Bertrand
Nicola Biggs
Eoin Billings
Giselle Blake-Davies
Dean Boston
Karen Brammell
Chris Brieger
Mark Bryden
Antoine Bussieret
Antje Bulthaupt
Andre Burmann
Steven Cadogan
Conal Campbell
Donnathea Campbell
Stefan Camenzind
Daniel Carr
Vincent Chang
Neil Clark
King Chong
Richard Connor
Julian Coward
Tom Coward
Ged Couser
Frank Craig
Geoffrey Crowe
Jo Curtis
Jonathan Davidson
Amanda Davis
Simon Dickens
Thomas Deuble
Eonone Dodwell
Nicola Downey
Elie Duffy
Chris Dukes
Bryn Dyer
Jim Dyer
Matthew Eastwood
Florian Eckardt
John Eger
Robert Ellison
Jason Embley
Philip Englebrecht

Kann Ernst
Paul Fear
Josephine Farrell
Max Fawcett
Michael Felton
Alex Fergusson
Gavin Finnan
Mark Fisher
Miriam Fitzpatrick
Kai Flender
Raphael Forny
Felna Fox
Kenny Fraser
Christian Froggatt
Rowena Fuller
Isabelle Gonzalez
Lisa Gort
Romaine Govett
Paul Grayshon
Donan Grayson
Birgit Graulich
Faruk Hadzovic
Andrew Hall
Jens Hardvendel
Jörg Hartenstein
David Hasson
Naomi Hasuike
Alex Haw
Jackie Hawkins
Sarah Hawkins
Hannibal Hayes
Gill Hayes-Wogon
Ben Heath
Susan Heathcote
Anja Henrike Kleinke
Marcus Hetzel
Zoe Hicks
Quintin Hinxman
Michael Holmes
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Susie Hunt
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Norman Hyde
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Duncan Jackson
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Aidan Jamison
Brian Jennings
Barbara Jones
Ewan Jones
Sandra Kaddatz
Mathew Keeler
James Keen
Anja Kennedy
Doug Keys
Andrew King
James King
Julian King
Rachel King
Andreas Klaus
Robert Kolack
Oliver Konrath
Helen Korndorfer
Angelika Kovacic
Karsten Kromschroder
Richard Kulczac
Annelie Kvick
Andrew Laitt
Quintin Lake
James Langford
Desmond Lavery
John Lee
Kirsten Lees
Richard Levene
Hennetta Lynch
Katharina Machule
Keith Mackenzie-Betty
Janette Mackie
Neill McClements
Andrew McConachie
Nicola Macdonald
David McDowell
Paul McGill

Stephen McGuckin
Michelle McLeod
Michelle McNally
Oliver Marder
Andrea Marlowe
Julian Maynard
Tammy Metcalfe
Jens Meyer
Leonard Milford
Jyoti Mistry
Linda Modest
Richard Morrell
Beate Muller
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Renata Musial
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Cecilia Osterholm
Kilian O'Sullivan
Brian Parkes
Visnja Pavic
Michael Pawlyn
Debra Penn
Esther Perea-Borobio
Adrian Philpotts
Stuart Piercy
Martin Pirnie
Vicki Polic
Juan Carlos Porral-
Hermida
Maria Porral-Hermida
David Pryce
David Radford
Christine Rayner
Susanne Raynor
Mandy Richards
John Ridgett
Steve Ritchie
James Robson
Joe Robson
Filomena Russo
Mustafa Salmán
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Patricia Scott
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Sarah Yabsley
Lee Yau
Ying-Soo Yau

Hugh Pearman is a London-based writer, broadcaster and lecturer. Architecture and design critic of the *Sunday Times* since 1986, he contributes to numerous other newspapers, magazines and periodicals in Europe and America. With the *Sunday Times* he has instigated and helped judge two annual award schemes for architecture: the Building of the Year Award, with the Royal Fine Art Commission (1989–95) and the Stirling Prize, with the Royal Institute of British Architects, since 1996. He was a founder member of the Architectural Advisory Panel of the Arts Council of Great Britain (1992–5), and serves on the Environmental and Public Arts panels of London's South Bank Employers Group. He was also the curator of the 1998–9 British Council international exhibition of Millennium projects, '12 for 2000'.

Previously published:

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Nicholas Grimshaw & Partners

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